

Book No. 43

Thibaudeau Lambrinos

1984 — A Bicentennial Project of the North York Board of Education

J. Bertis Taylor from Knox Ch. S. S. X mas 7 0 9.7. mr. C. Campbell . Teacher







THE EARTH WE LIVE ON.

WITH ILLUSTRATIONS.



LONDON:
FREDERICK WARNE AND CO.
AND NEW YORK.



THE EARTH WE LIVE ON.

Among grown-up people, the greater number see but a small part of the earth. Their business confines them to one country, and frequently to a small part of that country. Among young people very few indeed ever travel many miles from home. How delightful, then, it must be to them to be made acquainted, by means of a description, with every thing relating to the earth on which they live: and who can doubt whether the study of geography be interesting or useful?

Size and Shape of the Earth.

The earth is a large round body, not a perfect globe, but in shape somewhat resembling an orange. But while an orange measures about nine inches round, the earth measures about 25,000 miles.

It is upon the surface, that is, the outside of this

large globe that we dwell. What the inside is composed of, except a few hundred feet below the surface, we do not know.

The thickness of the earth, or its diameter, is about 8,000 miles. The diameter of a globe is a straight line supposed to be drawn from one point on its surface to another, passing through the centre or middle.

Should any one who has read of or seen any of the high mountains and deep valleys that are to be met with in most countries, say that it is impossible for the earth to be round with these large projections and hollows, let him reflect, that the highest mountain, compared with the size of the earth, is not nearly so great a projection as the very smallest grain of dust that may be seen sticking to an orange.

The Sun.

To us, who are accustomed to think of such bodies as stones and trees, hills and mountains, the size of the earth appears immense. But the earth, large as it appears, is a small body compared with the sun, which gives us light and heat. The sun is more than a million times as large as the earth.

Day and Night.

Take a large ball, and run straight through its middle a piece of pack-thread, between one and two

feet long, with a knot at one end to hinder the string slipping quite through.* If your ball be a white one, so much the better. Holding the string by the end at which there is no knot, raise the ball to a level with the candle, at a little distance from the table. Having done this, you may fancy, if you choose, that the candle is the sun, and the ball the earth.

Look at the ball attentively, and you will observe that the light of the candle shines on one-half of

the ball, while the other half is in darkness. Having observed this, next, while you hold the string up steadily with one hand, give the ball a spin round with the other. You will then observe, that though the light of the candle continues to shine, as before,



on only one half of the ball, the half in the light and the half in the dark are not, as before, always the same.

Should you wish to make this appear more plainly, stick a red wafer on your ball towards that end of the string which you hold in your hand; and as the ball spins round and round you will see the wafer

^{*} It is strongly recommended that this part be not read without having a real ball and candle.

sometimes in the bright light, and sometimes in the dark.

With every complete spin round that the ball makes, each part of its surface will be light and dark by turns.

Forget the string for a few minutes, and try to think of your ball spinning round of itself near the candle. You will then be able to understand how it is that the earth spins round.

The earth makes one spin every twenty-four nours, and each time that it makes the complete round we have day and night, that is, a period of light and a period of darkness. For, like your red wafer on the ball, at one time we are turned towards the sun, and at another time away from it.

Your ball is only a few feet from the candle. The earth is ninety-five millions of miles from the sun.

The Year.

Now, again, take hold of the string as before, go a little way from the table, give your ball a good spin, and holding it on a level with the candle, walk completely round the table.

Once more forget the string, and that it is you who are carrying the ball round the candle. Try to think of your ball spinning round and round of itself, and at the same time going round the candle.

The earth moves round the sun much in this way,

spinning round and round all the time. It goes round the sun in about three hundred and sixty-five days, or a year, and makes in that time three hundred and sixty-five complete spins; so that we have three hundred and sixty-five periods of daylight, and three hundred and sixty-five periods of darkness.

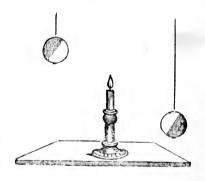
If you examine attentively, you will observe that there are two points equally distant from the candie. They are the points where the string comes through. As the ball spins round, every spot upon it, excepting these two points, is by turns in the dark and in the light, being as much in the one as in the other. And if the two points round which the earth spins were equally distant from the sun, the same as the two points round which your ball spins are equally distant from the candle, every spot in the earth, with the exception of these two points, would be, during each complete spin, in the light and in the dark by turns, and as much in one as in the other; and the days and nights would be equal, throughout the year, over the whole earth.

The Seasons.

But everybody knows that our days and nights are not of equal length throughout the year. Towards the end of March, and the end of September, our days and nights are equal, being each twelve hours long. Towards the end of June, our days are

more than sixteen hours long, and our nights less than eight hours. Towards the end of December, our days are not eight hours long, while our nights are more than sixteen hours. From December to June, our days are always becoming longer and longer, and from June to December, shorter and shorter. How this happens may be very easily explained.

Let us once more bring your ball to the candle. In this little drawing, the ball is placed in two different positions. In each position, however, the two points where the ends of the strings come through, are no longer in the same situation as respects the light of the candle. To the right of the candle, the point



nearest to the wafer is more within the light of the candle than the point furthest from the wafer. To the left of the candle, the point nearest the wafer

is less within the light of the candle than the point farthest from the wafer.

Take hold of the string which is run through the ball, as before, and hold the ball in the position in which it is placed in the drawing to the right of the candle. Suppose the ball to be spinning round the points where the string comes through, as it did before; what would happen? That point which is nearest to the wafer would be always in the light, as well as that part of the ball which immediately surrounds that point. That point which is farthest from the wafer, would be always in the dark, as well as all that part of the ball close to it. Every spin round, those parts of the ball which are near the wafer would be more in the light than the dark, and those parts towards the other end of the string would be more in the dark than the light.

Next, still holding the string, as before, bring the ball into the position in which it is placed in the drawing, to the left of the candle. Suppose it to spin, as before, round the two points where the string comes through. The point nearest to the wafer would be always dark, as well as all those parts of the ball immediately surrounding it. The point furthest from the wafer would be always light, as well as that part of the ball immediately surrounding it. Every spin round, those parts of the ball which are near to the wafer would be more in the

dark than the light, and those parts towards the other end of the string would be more in the light than the dark.

Now, fancy that the candle is the sun, and the ball the earth; and that England, or that part of the earth on which we live, is on the wafer. While the earth is making the circuit of the sun, the two points round which it spins are sometimes equally distant from the sun, and then our days and nights are equal. Sometimes the two points round which the earth spins are not equally distant from the sun, and then our days and nights are unequal.

Towards the end of March, and the end of September, these two points are equally distant from the sun; and the days and nights are each twelve hours long. Towards the end of June, that point which is nearest to England, is less distant from the sun than the other; and then our days are the longest and our nights the shortest; while all countries near the other point have, at that time, their shortest days and longest nights.

Towards the end of December, that point which is nearest to England is more distant from the sun than the other; and then our days are the shortest and our nights the longest; while all countries near the other point have, at that time, their longest days and shortest nights.

It will require a little attention, and more than one reading, to understand and remember thoroughly the description here given of the earth's motions. But will not your pains be well rewarded? it not be delightful to understand that the length of the year is measured by the time which the earth takes in making the circuit of the sun-that the year is divided into three hundred and sixty-five days, because, while the earth is making the circuit of the sun, it makes three hundred and sixty-five spins or revolutions round two points on its surfacethat during each revolution it is night over one half of the earth, and day-light over the other half-that our summer is caused by that point round which the earth revolves or spins, which England is nearest to, being less distant from the sun than the otherand that our winter is caused by that same point to which England is nearest being more distant from the sun than the other?





THE MOON.

While the Earth goes round the Sun according to the description already given, it is accompanied by another body much smaller than itself, called the Moon. The diameter of the moon is not quite 2,200 miles, and its distance from the earth is about 240,000 miles.

The moon is not a luminous body, that is, it does not shine by any light of its own, like the sun. It shines by reflecting the sun's rays. Opaque bodies, such as a brick wall, a wooden paling, the moon, the earth, reflect the rays of light which fall upon them. Transparent objects, such as clear water and glass, allow the rays of light to pass through them.

The moon makes a circuit of the earth in about twenty-nine days and a half; and is sometimes on the same side of the earth as the sun, and sometimes on the other side.

* This part can be rendered much clearer by using one of the late Professor Cowper's small orreries; to be procured at the depôt of the Christian Knowledge Society, Great Queen-street, London.

The light of the sun can of course only shine upon one half of the moon at once. When the moon is on the same side of the earth as the sun, that half of the moon which is lighted up or illuminated by the sun, is turned away from the earth. At that time, the moon is invisible to the inhabitants of the earth-it is what we call the change of the moon, or new moon. As the moon travels round to the other side of the earth, the illuminated part of the moon is gradually more and more turned to the earth, till at last the whole of the illuminated part of the moon is turned towards the earth. This is the period of full moon, when we see the full circle While the moon continues its course of light. round the earth, the illuminated part of the moon is gradually more and more turned away from the earth, till at last no part of it is again any longer visible.

This little drawing represents the situation of the sun (s), earth (E), and moon (M), at the period of





new moon. The half of the moon which is illuminated, is turned away from the earth. The dark

half of the moon, or that half upon which the sun's rays do not fall, is turned towards the earth. The moon is, therefore, invisible to the inhabitants of the earth.

moon.

In the next drawing, the illuminated part of the moon is turned towards the earth, making the appearance of full

Eclipses.

We all know that everything that is in the light casts a shadow on the side that is turned away from the light. If, on a fine clear day, you turn your back to the sun, you will see your shadow before you; and if you turn your face to the sun, your shadow will be behind you. Everything upon which your shadow falls will for the time be deprived of the direct light of the sun. So, also, at one side of the house you may see the sun, and at the other side, while close to it, the sun will be hidden from your eyes by the house. But if you walk away to a little distance, you will see first a part, and then the whole of the sun above the house. A small object like a house may thus hide a very large one like the sun.

What happens with your body, or the house, happens also with the earth and moon. At the time of full moon,

are on the opposite sides of the earth, if the sun,

when the sun and moon

earth, and moon, happen to be in a straight line, or nearly so, the earth hinders the light of the sun from falling on the moon; the moon is in the earth's shadow. As the moon only shines by reflecting the sun's rays, the moon is then invisible. Sometimes the moon is only partly in the earth's shadow, part being visible and part invisible. When the moon is thus in the earth's shadow, it is said to be eclipsed, totally or partially, as the case may be. Should there be any inhabitants in the moon, to them at such times the sun will be eclipsed.

The moon never ceases to move, travelling round the earth; and when an eclipse of the moon takes place, the moon moves through the earth's shadow. If, on the night of an eclipse, the sky be clear, and you watch attentively, you may see the moon gradually enter the earth's shadow, or first partially disappear, then disappear entirely, and at last gradually come out or emerge from the earth's shadow, and ence more display a beautiful full circle of light.

At the time of new moon, when the moon is between the earth and sun, if the sun, moon, and earth





happen to be in a straight line, or nearly so, the moon, either entirely or partly, hides the sun from

the inhabitants of the earth for a short time. The moon's shadow falls upon the earth, but only upon

a small part of the earth, because the moon is so very small a body compared with the sun. This is called an eclipse of the sun, total or partial, as it may happen. To all those persons who dwell on that part of the earth where the moon's shadow falls, the sun is eclipsed.

To those who dwell on those other parts of the earth which are turned towards the sun, but which are not in the moon's shadow, the eclipse is invisible.

The reason why eclipses, whether of the sun or moon, happen so seldom is, because the sun, moon, and earth are not often in a straight line.

Planets.

Besides the earth, there are other opaque bodies which move round the sun. These bodies are called planets. Some move round at a greater distance from the sun than the earth, and others at a less distance. Those planets which move round the sun at a less distance than the earth frequently pass between the earth and the sun. When this happens, if the sun, planet, and earth happen to be in a straight line, or nearly so, the planet hides a small part of the sun from the inhabitants of the earth. This is called the transit of a planet.

Stars.

Besides the sun, round which the earth and otherplanets move, there are many other suns, but they are at so immense a distance, that we cannot feel their warmth. These suns are called stars.

As the earth revolves or spins round and round, all these various bodies rise and set, appear and disappear by turns to the different countries on its surface.

By this time, we have no doubt that the more inquisitive of our readers are beginning to be-impatient to learn how we became acquainted with all these wonderful things; and to inquire whether we are quite sure of the correctness of our facts. They will ask us, and properly too, to explain or prove what we have been describing, and, therefore, we will endeavour at once to comply with their very reasonable request.

It must not be supposed that men arrived at a knowledge of the shapes, sizes, distances and motions of the sun, moon, and planets all at once. On the contrary, this knowledge was acquired very gradually, and by persevering study and observation.

Till within these few hundred years, men were not acquainted with one half of the earth as they now know it; and what they did know was supposed to be the whole. In shape the earth was thought to be a large flat body, part land and part water, and motionless. The sun, moon, and stars were believed to be about the size that they actually appear, and

to move in a large arch over the flat body—the earth; although it could never be explained how, when they had arrived at the end of the arch, they contrived to get back again and start afresh.

Studious and observing and reflecting men were long puzzled; they could not explain the rising and setting of the sun, moon, and stars, nor the eclipses and transits. They saw clearly that the prevailing notions were wrong, but they could not discover the truth.

After much examination, some men more happy than others in their investigations began to suspect that the earth was in shape like a ball or globe, that it revolved or spun round and round, and that it did not remain in one place, but made a circuit of the sun.

The circular shadow which is always to be seen upon the bright surface of the moon, during the progress of an eclipse of the moon, was thought to be a proof of the earth's roundness.

The apparent motion of the sun and stars, when the motion is really in the earth, was explained by showing that, as persons in a ship or carriage moving at a very rapid rate always fancy that the objects which they pass are moving, although the motion is only in the ship or carriage, so the inhabitants of the moving earth fancied that the sun and stars were moving, instead of the earth on which they were placed.

This reasoning convinced many people; but still many doubted. At last, however, all doubts about the roundness of the earth were removed, in the year 1519, by a navigator of the name of Magellan, who sailed round the earth. If the earth were a large plane, a person sailing in one direction would be continually getting further and further from the place whence he started. To go on in one direction, therefore, and yet come back to the same spot, could only happen on the surface of a round body.

Many navigators now sail round the earth every year; so that everybody has become satisfied that the earth is round.

The figures of the sun, moon, and planets, as they appear to us, are called their disks. Thus, we say the sun's disk, the moon's disk, a planet's disk.

If the apparent size of objects at a distance were not less than the actual size, the measure of the diameters and circumferences of the disks of the sun, moon, and planets would be the measure of the actual diameters and circumferences of those bodies. But everybody knows that a large object at a great distance appears small. A large ship or an immense mountain, when seen from a distance of several miles, seems a mere speck. This explains why the moon, which is a small body compared with the sun, appears to us quite as large; and why a cheese close to us looks as large as either. But objects,

although appearing smaller at a distance, still preserve their shapes; and knowing this, we are able to learn from the apparent shapes of the sun, moon, and planets, that they are all round bodies.

Besides, by the aid of powerful magnifying glasses and other contrivances, learned and clever men have been able to calculate the *actual* sizes and distances of those bodies from their *apparent* sizes as observed in different situations.

To understand how this is done, requires much more knowledge than our young readers can possibly have at present.

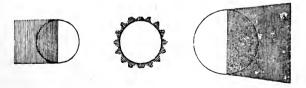
But it does not require any learning to understand that, when a planet, in passing between the earth and sun, appears like a small round dark spot upon the sun's disk, it must be much smaller than the sun.

Nor is there any difficulty in understanding that the moon is much smaller than the sun; since if it were not, when between the earth and sun, its shadow, instead of covering, as it does, a small part of the earth, would cover the whole.

The moon is sometimes so situated between the sun and the earth as to make, what is called, an annular eclipse; that is, the moon conceals from the earth all the middle part of the sun's disk, but leaves a ring of light still visible. This is another proof that the moon is much smaller than the sun.

An eclipse of the moon lasts much longer than an eclipse of the sun; that is, the moon is longer in travelling through the earth's shadow, which occasions the eclipse of the moon, than the earth is in travelling through the moon's shadow, which occasions the eclipse of the sun. This shows that the moon is smaller than the earth.

The shape of the earth's shadow also proves that the earth is much smaller than the sun. That shadow, as may be observed by the drawing of the eclipse of the moon, becomes narrower and narrower, as its distance from the earth increases, till at last it ends in a point. Now, if the sun and earth were of the same size, the shadow of the earth would continue of the same breadth, to whatever distance it might be prolonged. And if the earth were larger than the sun, the breadth of the shadow would increase with its distance.



This is clearly exemplified in the above drawing, where the sun is supposed to be in the middle, with the earth larger than the sun at one side, and equal in size at the other.

Here will finish that part of the description of the earth which is connected with the appearances of other bodies. They who are anxious to know more about the dimensions, movements, and distances of the sun, moon, and planets, (and there is much more to be learned,) must turn to books of astronomy. Our short account is merely intended to give some notion of the situation of the earth with regard to other bodies, and how the earth moves among them. No geography or description of the earth can be complete without some such account. But even if a description of the sun, moon, and planets were not a necessary part of geography, such an explanation must be acceptable to every one who has the least desire to understand the brilliant bodies which are apparently moving at such an immense distance around him.



THE MOON PARTIALLY ECLIPAGE



GLOBES AND MAPS.

When people wish to give to others a very perfect knowledge of a solid body of any kind, one of the ways of doing so, is to make a model of that body. There is no one of our readers who has not seen models, or figures, of men and women, horses and other animals, and also of ships and houses. It is found convenient, in general, to make these models smaller than the original objects from which they are taken. Teachers of geography, adopting the same plan, have contrived to make something like models of the earth; and these models they call globes.

A globe of the earth, or terrestrial globe, is a round body, upon which are drawn or marked out the different parts of the earth. Every thing is, of course, drawn very small upon the globe, compared with the actual sizes, but the shapes are preserved, and the distances and sizes of the different parts are all kept in proportion. A terrestrial globe is, in fact, a miniature plan or model of the earth. It is not possible, on a flat piece of paper, to give a correct

plan of the surface of a globe; nor consequently, as the earth is a globe, of the shape, size, and distances of the various parts of the earth's surface.



But it is so convenient to have even imperfect miniature plans, to carry about, and fold up, and bind together in books, that the want of perfect correctness is overlooked. Representations of different parts of the curved surface of the earth on a flat surface, are called maps.

In a book, we must be contented with maps, or go without any sort of plan or copy altogether. In

giving a map of the whole of the earth, the usual plan is, to suppose the globe to be cut in half, and to give a separate map of each half. This is what



we have done here. "Sphere" is another name for "globe," and these maps are called maps of the hemispheres, or half-globes.

By placing the maps of the hemispheres one on each side of the same leaf, precisely at the back of one another, the reader may fancy, if he pleases, that there is much more than the thickness of the paper between the two maps. He may fancy the

substance of the paper to be swelled or blown out like a bladder, turning the two flat surfaces or maps into one round surface. There is no better way than this of supplying the want of the globe itself.

THE POLES AND THE EQUATOR.

Having thus got something like a plan of the whole of the Earth's surface before us, we must next endeavour to learn how the situations and distances of the different parts of the earth are described. When you look at a globe or map of the Earth, and you see Europe, America, or China marked upon it, how would you describe on what part of the Earth these countries are? Possibly you would not know how to do so; but you may very easily learn.

There was a time when, much younger than you are, you did not know your right hand from your left; and if anybody had said, "Give me that book, or knife, or plate to your right," you would have been quite puzzled to know what to do. Such words as "right" and "left," "above" and "below," before" and "behind," are of great use in marking the situations of different things and places. There are similar, although not the same words, employed in geography; and these words are equally useful in pointing out the situations in different parts of the earth.

When you held the ball up by the string and made it spin, those parts of its surface which are nearest to either end of the string, were the parts which moved the slowest; and the parts of the ball's surface which are at the greatest distance from the two ends of the string, moved the quickest. In the globes that are made to represent the Earth, instead of string, a strong wire is run through the middle. This wire, upon which the globe spins or revolves, is called the axis; and the two points on the globe where the wire comes to the surface, are called the poles. The rotatory motion of the globe near the poles is very slow; but the motion increases as you get farther and farther from the poles, till at last you come to that part of the globe's surface, which is equally distant from the two poles. This part of the globe is usually marked by a line drawn all round; which line is called the Equator.

The equator divides the globe into two equal parts, one called the northern, and the other the southern hemisphere. The pole of the northern hemisphere is called the north pole; and the pole of the southern hemisphere is called the south pole. England, the country in which we live, and the United States of America, are in the northern hemisphere. The Cape of Good Hope, Brazil, and Australia are in the southern hemisphere.

The two hemispheres, of which the maps are given here, are not the northern and southern hemispheres. The globe, in these maps, is sup-

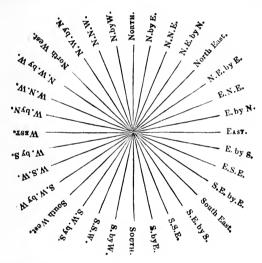
posed to have been cut into two hemispheres by a line drawn right through from north to south; so that each map contains one-half of the northern and one-half of the southern hemisphere.

POINTS OF THE COMPASS.

"North" and "South" serve as two principal marks to point out or make known the directions of different places. But if we had no other marks than "North" and "South," we should still be greatly at a loss to know in what direction to set off to any particular place. Suppose the captain of a ship who wanted to sail from England to the Cape of Good Hope, knew nothing more than that he ought to go south, he might go to South America; or suppose he wanted to sail from Brazil to England, and knew nothing more than that he ought to sail north, he might go to the United States of America, for they also are north of Brazil.

To avoid such inconvenience, other marks and names have been adopted. When a person looks straight to the north, all those countries which are situated in a direct line from his right hand are said to be to the "East;" and all those from his left hand, are said to be to the "West." Thus, we have four principal marks to exable us to direct one another to different countries, North, South, East, and West,—which are commonly called the cardinal points, and

are marked by the four letters N, S, E, and W. From these four points are made up twenty-eight more; so that we are furnished with thirty-two marks, by which we may make known to one another the direction in which different countries lie to one another.



Here we may be asked, "How is it possible to discover when we are looking straight to the north, so that we may be certain that we are not sailing or travelling towards some point the very opposite to what we intend?" The guide which is principally relied upon by navigators, who in the middle of the sea can have no landmarks to direct them, is the Needle or Mariner's Compass,

This needle is a long, thin, narrow piece of iron which has been touched with a magnet. It is supported in a horizontal or level position in such a way as to be nicely balanced in the middle, and at liberty to turn round in any direction. The peculiar property of a piece of iron that has been touched by a magnet, when so placed, is that it always points towards the north. The needle, supported as has been described, over a card upon which the thirty-two points are marked, is the Mariner's Compass. By looking at this, the mariner can always tell in which direction the north lies, and consequently in what direction he is sailing. By his chart (for chart is the name given to maps of the sea coasts) he can always know in what direction he ought to sail.

Besides the Needle or Mariner's Compass, there are other methods of obtaining this very necessary information. The advantage of the needle is that it gives the information at all times. The other methods can only be resorted to when the sky is clear. There is a particular star, called the Polar star, which is very nearly in a line with the north pole of the earth; that is, the north pole points towards it. A person who looks towards the polar star, therefore, looks towards the north pole, and thus becomes acquainted with all the other points of the compass. The sun is always due south, to those who live towards the north pole, at twelve

o'clock in the day, or noon; any one in England, therefore, who looks to the sun at noon, looks towards the south pole; on his right hand is the West, on his left hand is the East; and thus by this means, also, he becomes acquainted with all the points of the compass.

The earth spins round and round, or revolves from West to East. This is known by observing that, as we spin round out of darkness into light, we observe the sun towards the East; and as we spin round out of light into darkness, we observe the sun towards the West. The first is what we call sunrise; and the second, sunset. When we are exactly half-way between sunrise and sunset, the sun is due south—that is the time of our noon or mid-day. When we are exactly half-way between sunset and sunrise, that is the time of our midnight. They who live towards the south pole have the sun due north at noon.

Maps are generally drawn with the North at the top; and if on any occasion it is found preferable, on account of the shape of the particular country, to place the north in a different position, this deviation from the usual custom is always pointed out.

The points of the compass are of great use, also, in assisting us to make known to one another the direction of the wind. Everybody understands what is meant when we say, "We have a cold north-east wind to-day," or "The wind is due south." There are many ways by which we are in the habit of

udging of the direction of the wind—by the feeling, by the direction of the smoke out of the various chimneys; but what we place the greatest dependence upon, in general, are the vanes mounted upon high buildings.

A vane is a long piece of metal, usually copper or iron, placed horizontally and supported in the centre, like a needle, in such a way as to be at liberty to move round freely in every direction. But it is made much broader at one end than the other. The needle is placed under cover and turns, as it were, of its own accord. The vane does not move of itself, but is moved by the wind. As the wind blows, it carries the broad end of the vane along with it, so that the narrow end points to the quarter from which the wind blows. The commonest shape for a vane is an arrow. The feather of the arrow is the broad end which is blown along with the wind, while the barbed or narrow end points to the wind. A cock is sometimes mounted up instead of an arrow, the beak being the narrow end, and the tail the broad one. A vane of this shape is sometimes, as you may have heard, called a weathercock. The four cardinal points, N. S. E. W., are also frequently marked up with the vane, to make known the exact points of the compass.

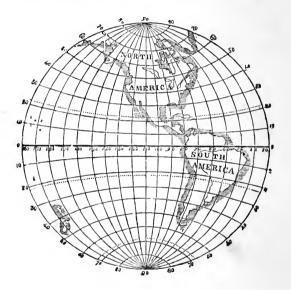
The points of the compass are found very serviceable in many other ways. Hardly a day passes that mention is not made of them for some purpose. If you inquire on what side of the street any person had been seen, or had appointed a meeting, you would probably be told the northern or southern, eastern or western side. Such a direction is much clearer than if you were told "right" or "left;" for what is "right" while you are turned in one direction is "left" if you turn in the opposite direction.

Not to know the points of the compass, therefore, is to be suffering daily inconvenience; and to be ignorant of the method of fixing and arranging those points is to be deprived of one source of pleasure—that arising from the thorough understanding of what our daily intercourse with others compels us to make use of.





LATITUDE AND LONGITUDE.



WE have observed how useful it is to know the direction in which different places on the earth are situated. Having learned the direction which one place bears to another, it is no less useful to ascertain the distance also. Suppose, for example, we wished

to sail from London to Quebec. Having learned that Quebec is west of London, we should be anxious to know in addition whether it is 10, or 100, or 1,000 or 10,000 miles distant.

In fixing upon measures with which to calculate distances, they should be contrived of such a length



as not to bewilder those who use them with an unnecessary number of figures. They should at the same time be sufficiently short to give a clear notion of the distance measured. To accomplish these two objects on all occasions, a variety of mea-

sures of different lengths have been invented; such as inches, feet, yards, fathoms, rods, furlongs, and miles.

12 inches are the same as 1 foot.

3 feet1 yard.6 feet1 fathom. $5\frac{1}{2}$ yards1 rod.40 rods1 furlong.8 furlongs1 mile.

Linen and woollen cloth, the length, breadth, and height of rooms, curtains, and other furniture, are generally measured in yards, feet, and inches. Small gardens, short streets, alleys, and pieces of road are measured in the same way. The cables of ships, and the depth of water in seas and rivers, are measured in fathoms. The length of roads from one place to another is divided into miles and furlongs.

The rule observed is,—the longer the distance to be measured, the longer should be the measure by which the distance is marked. Everybody can see how much simpler it is to say, "We came to anchor with 95 fathoms of cable," instead of saying "570 feet," or "6,840 inches;" although these three ways of measuring the same length are equally correct. From London to Dover, by the turnpike road, is 71 miles, or 124,960 yards, or 4,498,560 inches. Can any one doubt which of these is the more convenient measure?

The circumference of the earth being about 25,000 miles, if the distance between different

countries were always expressed in miles, the use of large numbers, however inconvenient, would be unavoidable. To prevent this inconvenience, a larger and more convenient measure, called a degree, has been generally adopted.

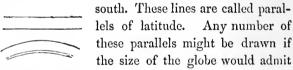
The circumference of a sphere is a line drawn round the sphere so as to divide it into two equal parts called hemispheres. A line may be drawn round a sphere which divides it into two unequal parts. Such a line is a circumference of a circle only, but not a circumference of a sphere. Any line drawn round the sphere which passes through both poles is a circumference of the sphere; and the equator, which is equally distant from both poles, is a circumference of the sphere.

The measure called "a degree" is contrived by dividing the circumference of a circle into 360 equal parts. Each of these parts or degrees is again divided into 60 minutes, and each of these minutes into 60 seconds. These measures of degrees, minutes, and seconds, combined with the directions of "north and south," and "east and west," enable us to point out with precision the different places on the earth.

To avoid the repetition of the words "degrees," "minutes," and "seconds," marks for those words have been invented; of for degrees, for minutes, "for seconds: thus, 40° 39′ 42" means 45 degrees, 39 minutes, and 42 seconds.

The distance between the two poles, measured in degrees, is 180 degrees; 90 degrees of which are between the north pole and the equator, and 90 degrees between the south pole and the equator. All places situated between the equator and the north pole are said to be in north latitude; and all places between the equator and the south pole are said to be in south latitude; the word "latitude" meaning "distance in degrees from the equator."

Lines are usually drawn on the globes to mark every 10 degrees of latitude, thus making eight circles to the north of the equator and eight to the



of them. They assist the eye in discovering what are the latitudes of different places.

Parallel lines are lines which preserve the same distance from one another, to whatever length they may be extended.

It has already been observed that a perfectly correct representation of the surface of a globe cannot be given in the shape of a map. The parallels of latitude, therefore, which are truly parallels on the globe itself, cannot be made so in a map. They are drawn as nearly so as possible.

While the distances north and south are measured

in degrees, and marked by circumferences of circles parallel to the equator, called parallels of latitude, the distances east and west are measured also in degrees, and marked by circumferences of circles perpendicular to the equator, called lines of longitude. The equator is a fixed line from which all nations have agreed to measure latitude north and south. But there is no fixed line from which all have agreed to measure longitude, east and west. Many nations are in the habit of measuring from the principal town in their own country. English measure east and west from London, or rather Greenwich, a little to the east of London; and as more maps and charts are printed in England than in any other country, and as the ships of England are more numerous than those of any other country, the English method of reckoning is beginning to be very generally adopted.

A line of longitude is a line drawn from pole to pole. It is half the circumference of the sphere, and cuts the equator at right angles. To cut the equator at right angles is to be perpendicular to the equator, for when two lines cross so as to be perpendicular to one another, they are also said to cut one another at right angles. Any number of these lines of longitude may be drawn, as may be found convenient, accord-

ing to the size of the map or chart. On the globes, as usually made, thirty-six of these lines are drawn; so that there is a distance of ten degrees between every two adjoining lines. But sometimes no more than twenty-four are drawn, and then there is a distance of fifteen degrees between every two adjoining lines. The first line of longitude is drawn through the place from which it is intended to measure the longitude of all others.

The distance between each pole and the equator being 90 degrees, the latitude of any place can never exceed 90 degrees; but its longitude may be as much as 180 degrees, or half round the globe. On some maps the longitude, instead of being reckoned "east" and "west," is reckoned "east" only, all round the globe. In this way of reckoning, the longitude of some places is nearly 360 degrees. The lines of latitude and longitude, crossing or cutting one another, enable everybody to discover with ease and certainty on the globe or map the situation of any place of which he knows the latitude and longitude.

A line of longitude is also called a meridian line. While the earth spins round or revolves from west to east, the sun appears to us to move from east to west. As each place in its turn comes directly opposite to the sun, it is noon at that place. Now every other place that is situated on the line of

longitude which extends from pole to pole, and passes through that place, has noon at the same time. The earth makes a complete spin or revolution every twenty-four hours. At the end of each hour, therefore, it is noon to places exactly fifteen degrees more to the westward: and when the meridian lines marked upon the globe are fifteen degrees apart or twenty-four in number, they are equal in number with the hours of the day.

The lines of longitude are not, like the lines of latitude, parallel to one another. They all meet in two points; and those points are the two poles. The poles have no longitude, and the degrees of longitude measure less and less as you get nearer and nearer to the poles, or farther and farther from the equator. But as the earth spins round, each place on its surface moves the same number of degrees in the same space of time. The degrees of latitude all measure the same; and a degree of longitude on the equator measures the same as a degree of latitude: that is, in each case the circumference of the sphere is divided into 360 parts, and one of those parts is the measure of the degree.

The number of miles in a degree of longitude on the equator and in a degree of latitude is easily found, for we know that the circumference of the earth is about 25,000 miles: and if we divide that number by 360, we shall get 69½ miles for the measure of a degree of longitude on the equator, or of a degree of latitude.

As you go farther and farther from the equator, or nearer and nearer to the pole, the degree of longitude measures a less and less number of miles, till at the poles themselves longitude disappears altogether. At Petersburgh, the principal town of Russia, situated in 60 degrees north latitude, the degree of longitude measures $34\frac{3}{4}$ miles, or exactly one-half of $69\frac{1}{2}$ miles, the measure of a degree of longitude on the equator. During each complete revolution of the earth, therefore, Petersburgh, although it is carried round the same number of degrees as any place situated on the equator, is only carried round half the number of miles.

When you know the latitude and longitude of a place, and wish to find its situation on the map, you must look at the top or the bottom of the map where the degrees of longitude are marked, and at one of the sides of the map where the degrees of latitude are marked. Put your finger on the spot where the longitude of the place which you are desirous of finding is marked at the top or bottom of the map, and carry your finger from that spot perpendicularly across the map. Find the spot at one of the sides where the latitude is marked, in the same way, and carry a finger of your other hand horizontally across the map. The place which you wish

to find will be exactly where your two fingers meet on the map.

Knowing that a degree of longitude on the equator and a degree of latitude measure $69\frac{1}{2}$ miles, the method of finding the distance in miles between any two places is simple. Stretch a piece of thread across the globe or map, from one place to the other, and mark the distance of the two places on the thread. Apply this thread to the equator or the line on which the degrees of latitude are marked. You will then know the distance between the two places in degrees of latitude, and these degrees of latitude multiplied by $69\frac{1}{2}$ will give the distance in miles. The distance from London to Petersburgh, measured in this way, is equal to about 17 degrees of latitude, which, multiplied by $69\frac{1}{2}$, gives about 1,200 for the distance in miles.

There are other reasons for making use of "degrees" as measures of distance, but these cannot be explained at present.





THE DISCOVERY OF AMERICA.

The parts of the world which were known 400 years ago were Europe, Asia, and Africa. Each of these three great divisions contains several smaller divisions called Countries. Europe, in which we live, contains England, France, Germany, Italy, and Spain and Portugal, and many other countries besides. The people who, at that time, dwelt in these parts traded with one another, and believed themselves to be the only inhabitants of the world. They had never ventured to sail far out into the great ocean which surrounded them.

The most westerly lands known to the people of Europe were, the Madeira Islands, the Canary Islands, and the Azore Islands. And when we look at the map, and see how far out in the sea these islands are situated, we cannot but admire the bravery of the man who first dared to stretch out so far as to reach them. Sailors now cross these and other parts of the Atlantic Ocean without much danger; but those who first discovered these islands,

and explored the ocean which surrounds them, had no charts to guide them and to protect them from shipwreck.

In the year 1435 Christopher Columbus was born. His father, who was a poor hard-working man, lived in Genoa, a city of Italy. Poor as he was, however, he took care that his son Columbus should be taught, while young, reading, writing, and arithmetic.

Columbus was fond of studying maps and reading accounts of other countries. The study of geography, as he grew up, occupied more of his time than any other employment. The pleasure which he derived from this pursuit made him long to visit other countries. At fourteen years of age he became a sailor; and during his youth he sailed about the Mediterranean, sometimes in merchant-vessels, and sometimes in vessels of war. He encountered many dangers and hardships, but learned well the proper management of a ship. And thus it was, that he made himself, while yet a young man, an experienced and clever sailor.

His daring spirit soon urged him to extend his voyages beyond the Mediterranean Sea. He sailed through the Straits of Gibraltar into the Atlantic. He visited Lisbon, the principal city of Portugal, and resided there some time. He afterwards visited the Madeiras, and made a voyage to the west coast

of Africa. While at Lisbon, and during these voyages, he carefully observed every new occurrence, and read all the voyages, and stored up all the knowledge that he could procure from other sailors. And it was these observations and inquiries which first led him to suppose that there might be land still to the westward even of the Azore Islands.

"The Azores," thought he, "were once unknown, but it only required some man a little bolder than others, to discover these; and why may there not be lands to the westward of the Azores, which it only remains for some fortunate adventurer to make known?"

Some of the facts which encouraged him to persevere in this supposition of the existence of land to the westward of the Azores, are very curious. He had learned that at the Madeiras, Canaries, and Azores, trunks of huge pine-trees, such as did not grow upon any of those islands, had been washed on shore by the westerly winds. Reeds of canes, similar to the sugar-canes of India, but of a larger size, had come occasionally from the west. Pieces of wood cut in a strange shape, and curiously carved, differing much from any seen before, had been picked up. But above all, two dead bodies of men with features quite unlike those of the people of Europe, Africa, and Asia, had been cast upon one of the islands, and had occasioned much wonder.

These strange events, as they occurred one after the other, appear to have been regarded as mere objects of idle curiosity, until Columbus, putting them all together, was led to think, that trees coming from the west must have grown on land; that the carved wood must have been worked by men's hands; that the strange men whose dead bodies had been washed on shore, could not have existed in the water, but must have had wants much the same as other men, and therefore must have dwelt upon land; and that all coming from the west, strongly proved that there was land, as yet unknown to Europeans, to be found in that direction.

So convinced did Columbus become that new countries were to be discovered in the west, that he was willing to risk his own life, and to sail away over that vast untried ocean in search of them.

But he was a poor man. He had neither money himself, nor rich friends who might assist him with money. He had no ship of his own, nor would anybody trust him with one for such a purpose. Even if he could have procured a ship, he had no rewards to offer, so as to persuade daring men to accompany him in the enterprise. How, then, surrounded with so many difficulties, could he accomplish his wishes? how make good his belief of new and distant countries still to be found in the west, by the man brave enough to attempt the discovery?

While he was thinking of the best way to conquer all these difficulties, he made a voyage to Iceland, in the Northern Ocean.

Upon his return from this voyage, he resolved to try to persuade the king or governor of some country to fit out for him the necessary ships, so that he might go at once and make the intended discoveries.

Having been born in Genoa, he first offered his plan of discovery to the chief men who governed that city. But, humble in station, and unknown except to a few sailors, he found himself treated with contempt by these powerful men, who laughed at him, and refused either to listen to his reasons, or to assist him.

Much disappointed, but still resolved to persevere, he went to the King of Portugal. At this time, the Portuguese were the best sailors, and made the longest voyages of all the people of Europe. He was not laughed at by this King, but he was worse treated—for he was treated dishonestly. Pretending to listen to him, the Portuguese King got from him part of his plan, especially the direction in which he proposed to sail, and then refusing to assist him, sent out one of his own captains with some ships, to attempt to make the very discovery which the ill-used Columbus had been the first to propose.

This disgraceful conduct of the King of Portugal

grieved Columbus exceedingly; but unable to help himself, he waited with much impatience to learn the success of the voyage thus dishonestly undertaken. The captain sent out did not succeed. Having met with stormy weather, he became alarmed, and returned to Portugal, saying, that the expectation of finding countries to the west was all a dream.

As soon as Columbus learned the return of these ships, he departed for Spain. He was now so poor that he was frequently obliged to beg as he went along.

One cold windy night, a stranger, carrying a young child in his arms, arrived at a small village near Palos, a sea-port in Andalusia, a province of Spain, and not far from Cadiz in the same province. He begged for bread and water, saying that both he and his child were faint with hunger and fatigue. Some kind people relieved this man, and took him into their house. This stranger was Columbus, journeying towards Cordova, to submit his proposal for the discovery of new countries to the King.

The people who befriended him in his misery, when they heard the reasons that he gave for coming to Spain, were so much interested in his behalf, that they assisted him with money to continue his journey to Cordova, where he expected to find Ferdinand and Isabella, King and Queen of Spain. Some of them even went with him, and when they arrived at Cordova, got Columbus presented

to the Queen, and soon induced her to promise to support him.

But now that he was attended to, he was still kept lingering. The promise, it is true, was made, but it was not fulfilled. Many years passed away before the Queen could resolve really to assist him. She kept him waiting, not being able to decide upon engaging in so wonderful an undertaking, and at the same time not liking to refuse his offer, which, if he should succeed, would gain her so much credit.

During seven years, Columbus had need of much patience. The ignorant and idle rich men about the palace made game of him, because he was a humble and poor man. These men were too ignorant to understand his reasons for believing that there might be other countries beyond the seas, and they were too idle to take the trouble to try to understand them. So they reproached him for his poverty, which he could not help, and called him a dreamer.

His friends at Palos did not forsake him, and it was principally through their assistance that he at last got Queen Isabella's favourable decision. She gave orders that three of her vessels lying at Palos should be delivered to him, and furnished him with money to engage sailors, and prepare all things for the voyage.

Delighted with this favourable decision, he ence more returned to Palos. All difficulties, he hoped,

were at last overcome. Disappointments, however, still awaited him. The sailors disliked to go—they were afraid to embark on such an expedition, and even the boldest seamen refused, for a time, to accompany him.

At length, however, partly by persuasion, partly by the example of two brave and wealthy mariners named Pinzon, and partly by impressment under a Royal order, a crew of 120 men was collected and got on board the vessels. Their friends, bewailing their unhappy lot, took leave of them as of men destined never to return, but rather to be swallowed up in the waves of that vast unknown ocean, to which they were going.

Columbus, full of hope and joy, cheered them with assurances of success, and tried to reason them out of their fears. But still he saw only despair and sorrow expressed in the countenances of many of the sailors, who continued loudly to declare their dislike to accompany him. To each of the Pinzons he gave the command of a vessel. The names of the three ships were the "Santa Maria," on board of which Columbus went, the "Pinta," and the "Nina."

The vessels thus given to him to undertake a long hazardous voyage were old and almost worn out, and so small, that only one had a deck, and that was the "Santa Maria;" the other two were little better than open boats.

On the 3rd August, 1492, the vessels sailed. Columbus first directed his course to the Canary Islands, intending when he had reached them to steer due west.

At the Canary Islands he was detained some time repairing his old and leaky vessels, one of which had lost its rudder. On the 6th September he again set sail in search of the new countries which he had been so long desirous of sailing to discover; but owing to calms and contrary winds, he did not entirely lose sight of land till the 9th.

Now began the real dangers and difficulties of Columbus. It required all his patience and courage to bear up against the many troubles he met with. His sailors had from the beginning opposed him as much as they dared, on account of their dislike to the voyage. As long, however, as they were at no great distance from land, they performed their duty without much repining. But when the last glimpse of Ferro, the most western of the Canary Islands, had disappeared from their sight, when they saw themselves in the midst of the vast untried ocean, then their fears became so great, that they actually cried like children.

"We shall never, never again return to our own homes!" they exclaimed; "We shall never again see our dear friends and children. We shall be swallowed up in the waves of this unknown sea. Oh,



foolish men that we were! why did we consent to accompany this mad Columbus?"

In vain did Columbus beg them to remember that their voyage had hitherto been without storm or alarming accident, and that, therefore, they had really nothing to complain of. These childish men were obstinate in their fears.

Many circumstances which, now that the seas are known, are scarcely noticed, at that time filled them with alarm. The trade wind is one of these circumstances. The wind, called the trade wind, blows steadily from north-east to south-west across the Atlantic Ocean, from the Madeira and Canary Islands to the West Indies. This wind is now eagerly sought for by sailors, who steer their ships into it, that they may be carried along in the direction in which they wish to go, without any trouble. They rejoice, knowing the places to which this wind will take them. But Columbus' sailors feared; being uncertain to what unheard-of danger it might carry them, or whether it would not hurry them to destruction.

A few days after sailing from the Canaries, the ships of Columbus came within the influence of this wind; and so beautifully did it waft them along, that for several days not a sail was altered. This continuance of favourable weather, for so at first it was considered, spread satisfaction among the crews of all the three ships.

When they had proceeded some distance, they met large patches-of sea-weeds and herbs drifting from the west. Columbus supposed from this, that they should soon fall in with land. "See," said he, to the sailors, "herbs are drifting around us. These herbs require earth to grow in; they come from the west; they must have been washed by the waves from some shore."

One of the sailors discovered a live crab on a patch of this sea-weed—another proof to Columbus that land was near, for crabs are generally picked up at low water, on the sea shore. Happy man! his crew was so cheered by the sight of these fancied land-marks, that he heard no complaint for some days, and the voyage proceeded merrily.

As they advanced, further signs of land were perceived. Some large birds made their appearance, flying from the west.

The sailors were now as eager to discover the expected land, as they had before been reluctant to sail in search of it. They continually mistook the distant clouds for the desired shore, and shouted, "Land! land!"

When these shouts of "land!" were heard by Columbus, much as he wished that the guess might prove true, he still doubted. A common, although not certain sign of the approach of land, is the gradually decreasing depth of the water. No sooner,

therefore, did Columbus hear the cry of "land," than he ordered the lead to be thrown overboard, to take, what is called, soundings.

The sea-line, with which soundings are taken, is a long rope, with a piece of lead fastened to the end of it. This line measures a certain number of fathoms in length, and a fathom is six feet, or two yards. When seamen wish to know the depth of the water under the ship, they throw the lead into the sea, and allow the line to run out till the lead reaches the bottom. The length of line which runs out shows the depth of the water. But should the water be deeper than the line is long, no soundings can be taken.

Disappointment awaited Columbus, for on sounding he could find no bottom; and he could not help fearing that he was not so near the desired land as the sailors expected. Indeed, he was still in the middle of the ocean. The sailors now again became uneasy and troublesome. They tormented their patient and brave leader with their fretful and ignorant fears.

The trade wind, which at first they had hailed with pleasure, now filled them with alarm. "The wind never changes," said they: "it never will change, it will blow on from east to west for ever—it will never let us alter our course and return home. How unfortunate we are to be doomed to die on these lonely seas!"

It required much good sense and courage to manage such men as these sailors. Columbus felt for their alarms, which were not altogether without reason. For several days nothing had been seen but sea and sky. No one had ever been in that track before. They were all ignorant as to where they were being driven; and over the trade wind they had no control. The ships were so old, that had they met with storms they might have foundered. Their stock of provisions was also a cause of uneasiness to them. "If," said they, "we should not find land, and the wind should continue in its present direction, we shall not be able to return, and then, when the provisions which we now have are exhausted, we must perish with hunger."

At this time of despair, some breezes from the west springing up, Columbus directed his men's attention to this change of wind, and pointed out to them that the wind, prevailing as it had done for so many days, might only be a peculiarity of that part of the new sea which they had been sailing through.

This change of wind was followed by a sight which gladdened their eyes, and calmed their fears more than any other thing that had as yet happened. Several little birds, such as live in fields and gardens, visited the ships. They came regularly in the morning and flew away again in the evening. Their

chirping and singing were sweet music to the sailors' ears. It was the first sound of land that the sailors had heard since their departure from the Canaries.

The appearance of these little visitors was made the occasion of a general rejoicing in all the ships.

"My friends," said Columbus, "now you may have hopes of soon seeing the wished-for land. These birds, which come singing to us so sweetly in the morning, and leave us so regularly in the evening, must have a home or nest somewhere near. They are so fresh and lively, that their journey to us cannot have been long and fatiguing."

"Ay, ay," said the men, "you are right—their wings are too feeble for long flights—land must be near."

"The birds that visited us before," added Columbus, "were much stronger and larger than these. They were sea birds, but these little creatures are land-birds, and make us remember our own fields and homes. We shall soon return there, with the pleasure of reflecting that we persevered through every danger, and that by so doing we discovered a new country."

This general content, however, did not last long. The wind died away entirely, and there was not a breath of air to fill the sails. The ships remained motionless, and the sea was so thickly covered with

weeds, as to look like a green marsh flooded with water.

The sailors were exceedingly frightened at seeing that the ships did not move. They forgot that such accidents sometimes happened on the seas which they had been accustomed to sail upon. They fancied that the ships were stuck fast in the weeds, and that they had arrived at the end of the ocean; and they fully expected, in case the wind should again spring up, to find themselves run aground on some reef of rocks or sandbank. Columbus sounded for the depth and found no bottom. This in some measure quieted the alarms of the crew.

But the calm still continuing, the men became so unruly, as to declare openly that they would proceed no further; and they threatened to throw Columbus into the sea, unless he consented to give up his mad voyage, and take the first opportunity of again turning towards Spain.

"Are we to proceed on, on, on, till we all perish of hunger, or until our rotten ships fall to pieces? We have already crossed seas upon which no sail was ever before seen, and what good has it done? What land have we found? We shall find no land. We will think of our own safety. Every day will take us farther from our homes. We will sail on no longer; we will return home."

"What!" exclaimed Columbus, "give up the

voyage, now that we have almost found the land we seek! Surely no man among you can be so cowardly! Have you already forgotten the land-birds that visited our ships but three days ago? Oh, no, my friends; we must not go back. Only a little farther and all our labour and toil will be rewarded. Sail with me for a few days longer."

At first the sailors refused. One of the Pinzons then interfered, and begged Columbus to alter the course of due west, that he was steering, to southwest, because the flight of birds had been observed to depart in that direction: and the sailors, after a little delay, agreed to sail during three more days, provided Columbus would steer more to the southward. In order to gratify his men, therefore, on the 7th October, Columbus altered the course of the ships to the south-west.

Signs of land came now more thickly. Not only were fresh green herbs seen, but fresh leaves of trees occasionally floated past the ships. More flights of small birds visited them. A branch with red berries, and a stick carved in a strange manner, were also picked up.

"Who can doubt, now, that we are approaching land?" asked Columbus, as he showed the branch of berries and the carved stick to his crew. "Do berries grow in the sea? Do fish or birds carve sticks in this curious manner? The land cannot be

far distant, for if the carved stick may have floated from afar off, that cannot be the case with these berries, which by their freshness prove that this branch upon which they grew, has not long floated on the waters. We must be approaching land every hour. Let us persevere but a little longer, and our toil will be rewarded."

So near was land now believed to be, that as the breeze was fresh, and the ships were going at a great rate through the water, Columbus, in order to guard against accidents, determined to keep watch all night, and took his station upon the top of the cabin for that purpose. The anxiety and restlessness were general in all the ships. No one went to sleep that night. All were engaged looking out for land.

Although Columbus had to his men always appeared cheerful and confident, he had felt within himself occasional doubts and uneasiness. But his agitation was now greater than ever.

As he sat alone on the top of his cabin, gazing earnestly all along the horizon, suddenly he saw or thought he saw, through the darkness, a light glimmering faintly at a great distance. He fixed his eyes upon this new appearance. The light moved. At one time it became stronger, as if coming nearer, at another it again grew fainter or less distinct.

Columbus feared that he was in a dream. His

anxiety to discover land might cause him to fancy this light; and to convince himself that his eyes did not deceive him, he called up one of his crew, and asked him whether he saw anything in the direction that he pointed out to him.

"Yes," said the man; "I see a light."

Columbus clasped his hands together, and exclaimed with a loud voice, "It is so, it is so; it must be so!" Still, however, not quite satisfied, he called up another man and asked him the same question.

By the time that this man arrived, the light had disappeared from the place where Columbus first saw it, and was seen only in short gleams, as if it were either in a boat, and hid every now and then by the waves as they rose and sank, or else as if it were being carried along the shore, and was hid from time to time by trees or houses.

Columbus now felt certain that he had found land, and that the land was inhabited.

They sailed on. At two o'clock in the morning, four hours from the first appearance of the light, the "Pinta," which was ahead of the other ships, fired off a gun.

Joyful sound! it was the signal of land.

"Land! land!" was shouted from ship to ship with one glad voice.

Columbus covered his face with his hands, over come by his feelings of happiness, that in spite of

so many difficulties, he had made the wished-for discovery. The tears fell fast from his eyes as the seamen continued to hurra and shout "Land! land!"

When he became more composed, he left the deck, and gave orders that the ships should have their sails taken in, and should lie to until the dawn of the morning would enable them to approach nearer to the newly discovered land without danger.

The rest of the night was spent by the crews in talking over the expected sight of the morning.

"Shall we find people in this new country?" asked the sailors one of another. "Shall we find houses and cities like those in Spain?"

"Shall we find food?"

"Shall we find men like ourselves, or strange looking monsters, who will be as fierce and cruel as they are frightful; or shall we find a wilderness, in which neither man nor animals of any description are living?"

In asking these various questions, the few hours until the appearance of dawn were passed. No one could answer the question of his neighbour. All were equally ignorant—all equally anxious as to the kind of people they should find living in the new country. All, however, felt glad that their brave and persevering commander had not been prevailed upon to turn back.

When at length the day did break, they saw an island, that seemed to their eyes, so long used to the sight of nothing but sea and sky, the most beautiful that they had ever beheld. The trees were so thick and luxuriant, as to appear a never ending grove.

The sea along the shore was clear and sparkling—and the gentle breeze that blew from the land wafted to them the most delicious perfumes. As the day advanced, people who were quite naked were seen running from among the woods towards the shore, and then away again into the thickness of the woods, showing by their manner that they were astonished at the sight of the ships hovering on the coast.

Columbus ordered the anchors to be let go, and the boats to be got ready, and dressing himself in a bright scarlet dress, he entered his own boat with some of his crew.

The two Pinzons, who commanded the other vessels, the "Pinta" and "Nina," put off in their boats also, and joined their leader.

The boats soon reached the shore. Columbus impatient to place his foot on the land which he alone had been the cause of discovering, was the first to jump from the boat. His joy was greater than can be told.

As soon as his companions had landed, he planted the flag of the Kirg of Spain on the coast, meaning to signify that the new land was from this time to belong to that king. In doing so he only followed the orders which he had received, but these orders were unjust and cruel. Unjust, because the land was already occupied by others, who by their labour maintained themselves and children out of it; and cruel, because it was intended to inflict pain and punishment upon the inhabitants should they oppose this attempt to deprive them of their own.

The people, whoever they might be, who dwelt in this island, would most likely have little properties, such as huts, and gardens, and cattle. All these things at once, together with themselves, their wives, and children, Columbus took possession of by order of the King of Spain, a stranger to them, for him to do as he liked with. Owing, however, to the general ignorance of such subjects at that time, Columbus was probably not aware of the great wrong that he was helping to inflict. Had the people of this island been able to resist such cruel injustice, no one would have returned to Europe to tell the tale that a new land had been found. But they were for the most part of a gentle, peaceful nature, very ignorant, and quite unable to resist the swords, muskets, and gunpowder of the Spaniards.

The flag being planted, Columbus gave the name of San Salvador to the island. On looking to the

map, it will be found among the islands called the Bahama Islands. This small island was the first discovered of them.

The simple and ignorant people who inhabited this island, on seeing the Spaniards approach the shore, were so alarmed, that they fled to the thickest parts of the woods. But after a time, as their curiosity got the better of their fear, they began gradually to come forth from their hiding places.

They supposed that both ships and men had, during the night, risen out of the waters, or come down from the clouds. The sails of the ships they mistook for wings, and the sound and flash of the guns for thunder and lightning. The sailors, also, they did not suppose to be men like themselves, disguised as they were with their clothes and armour.

Everything was new and strange to them, and so different from what they had ever seen in their own island, that their mistakes and surprise are not to be wondered at. For themselves, they wore no clothing, but had their bodies painted in various colours and fanciful patterns. The natural colour of their skins was a reddish copper brown, and their hair was long, straight, and black. They had not, like the Spanish sailors, beards growing on their chins; and their only arms were wooden lances, pointed with a fish bone.

The fine colour of Columbus' dress pleased the natives exceedingly, and they seemed to pay much more attention to him than to any of his companions. When he offered them a few coloured glass beads, and some bright brass bells, they soon forgot their fears, and flocked down to the shore in great numbers.

As the hour of sun-set approached, the three boats again put off from the shore, and joined the ships that remained at anchor.

Columbus was so much pleased with his new discovery, that he did not continue his voyage for some days. During his stay the boats were constantly proceeding to and fro between the ships Columbus wished to give all his and the land. sailors an opportunity of visiting the island. He knew how great the delight must be to them to feel themselves once more on land, after so long and hazardous a voyage. And as only a few could with safety quit the ship at a time, the sailors went by turns in the boats. He wished also to make friends with the natives, whom he found mild and In return for the trinkets which they received from the Spaniards, they brought fruit and a sort of bread, made from the yucca root, and which they call cassada, and the sweet potato, which had never till then been tasted by the people of Europe. They brought besides some rolls of cotton and some tame parrots. The island was called by them Guanahani.

These friendly Indians did a still greater service to their visitors. The fruits, and cassada, and potato, the Spaniards might have done without; but they could not do without water. And owing to the length of their voyage, they had nearly drunk all that they had brought from Spain and the Canaries. Springs of fresh and clear water abounded in the island; and the Indians not only pointed out the best and largest, but assisted the Spaniards to roll their casks to and from the boats.

Columbus having thus refreshed his crews, and supplied the ships with water, again set sail. He proceeded in a southerly direction, because he understood, from the imperfect signs of the Indians, that he should find a larger island in that direction. He ran through several of the small islands of the Bahamas, and on the 28th of October arrived at the large island of Cuba. Cuba is the name by which this island was called by the people who inhabited it, when he first landed among them. He did not alter this name, and it still goes by the same to this day.

After he had taken possession of Cuba, and partly explored it, he again sailed on, in a south-easterly direction, and discovered Hayti. He called this island Hispaniola; it has since been named St. Do-

mingo; and at this present time it is once more generally called Hayti.

Still he had not discovered the Continent of America. The islands which he had discovered he called altogether the West Indies, because he supposed them near to India, which they are not. Although they are many thousand miles distant from India, these islands still keep the name of West Indies, given to them by Columbus: India, by way of distinction, being called the East Indies. The original natives of America and their descendants are also called Indians for the same reason—the early mistake of Columbus.

At Hayti he had the misfortune to lose his own vessel, the "Santa Maria." She was wrecked on the night of the 24th of December. Columbus having had no sleep the night before, had gone below to lie down and rest himself. According to his custom, when he was not able to be on deck himself, he had given the vessel in charge to an experienced sailor. This careless, this lazy, this untrustworthy man, instead of performing the duty confided to him, and watching over the safety of the ship and the lives of his companions, deserted his post, and went to sleep, leaving the vessel to the management of a young and thoughtless boy. The rest of the crew, consulting present ease more than their safety, followed his example. The rapid currents which prevail on that coast, and

which require the strictest vigilance, soon carried the vessel, thus abandoned, on to a shoal. Columbus and his sleeping crew, roused by the striking of the ship, and the cries of the terrified boy, hurried up, some from below, and some from the fore part of the deck, where they had stretched themselves out in fancied security. They first endeavoured, by taking out an anchor, to warp the vessel off. But the strength of the current was more than a match for them, and the vessel was driven farther and farther on to the shoal. The rudder was soon beaten off. They then cut away the masts, and took out some of the stores to lighten her. But all their efforts were vain. Before sunset the next evening the ship was a complete wreck. Fortunately one of the other vessels, the "Nina," was close at hand, and the shipwrecked mariners got on board of her, with such stores as they were able to save.

As the Spaniards were much delighted with Hayti, and as the loss of the largest of the vessels would have made it difficult to transport so many men back to Europe, Columbus consented that forty of them should remain in the island, while he and the remainder made the vovage back. He promised to return to them speedily. With the timber of the island, and the wreck and guns of the "Santa Maria," he built them a fort, and after enjoining them to be kind and peaceful in their behaviour to the natives,

and having done all in his power to provide for their comfort during his absence, he set sail.

He took with him some fruits, cotton, and sweet potatoes, and also some of the natives, or, as he called them, Indians; judging that these specimens of the productions and of the inhabitants of the newly discovered countries, would be more satisfactory to the King and Queen of Spain, than a mere account from him, either in words or writing.

His voyage to the West Indies had been without a single storm. His return to Europe was not so fortunate. A most dreadful tempest arose when he was near the Azores. He expected every moment that the weak and worn-out vessel in which he was. would be shattered by the fury of the winds, or dashed to pieces by the waves. This was a moment of great trouble to him. When a storm arises at sea, all sailors feel anxious for their safety. But Columbus felt more than this-he feared that his great discovery would be for ever unknown to his countrymen. He feared that, instead of the praise and credit he should receive if he reached Europe. he should be remembered only as a wild and foolish adventurer; and that, alarmed by his fate, no one would ever attempt to make the discovery, in which he would be supposed to have failed. Expecting every moment to be swallowed up by the waves.

his anxiety to preserve some small trace of his success, made him adopt a plan, which has since been often used by the captains of ships in distress. He wrote on parchment a short account of his discovery, and put it into an empty cask, which he carefully closed, and then threw into the sea. He hoped that if he should perish, this cask might be picked up by some ship, or be washed on to some coast.

Fortunately both the ships rode out the storm; but as they were separated, they were ignorant of each other's safety. Columbus reached Palos first, in the "Nina." He arrived at that port on the 15th of March, 1493; and the "Pinta" arrived soon afterwards. The meeting of the two crews, as may be supposed, was a happy one, for they had each feared that the other ship had foundered.

The news of the arrival of Columbus, and of the great discovery which he had made, filled all people with joy and wonder.

The return of him and his companions had been so long delayed, that they had almost been given up for lost; and they were supposed to have met their death in various horrible ways. When, therefore, they were again seen and heard, the rejoicing of their friends was unbounded. All the bells in the place rang to mark the joyful event; the shops were closed, for no one could attend to business on such a

day; and the people flocked in crowds to the harbour to see Columbus land. Most astonishing and gratifying was the sight. First walked Columbus, followed by some of his crew, carrying beautiful parrots, the cotton, and the various plants and animals they had brought with them. Then came the most curious sight of all, some of the people who inhabited the new land, namely, the six Indians, who wore their clumsily made ornaments of gold, and were painted after the fashion of their country. The streets were so thronged that Columbus and his procession could hardly get along; while the shouts of joy and welcome were so loud as to be quite deafening.

Columbus, engrossed in his own thoughts, walked along in silence. In the midst of all this rejoicing, he could not but remember the time when he had first arrived at Palos, as a beggar, with his little son, and was obliged to ask for bread. He could not but remember also, that in sailing from Palos, on his voyage of discovery, he had been followed by the murmurs and hatred of those who now made the streets echo with their shouts of joy and welcome, calling him by every name of praise and honour.

For a long time nothing but Columbus and the New World, as the Spaniards called it, was talked of. He was received by the King and Queen with the greatest kindness, and was rewarded with numerous presents. Shortly afterwards he was engaged to make another voyage, that he might proceed with his new discoveries.

Accordingly on the 25th of September of the very same year of his return, he again set sail with a numerous fleet. He no longer found any difficulty in getting sailors to accompany him, so great was the number of those who desired to visit these newly discovered and beautiful islands.

Again touching at the Canaries, and running down with the trade wind as before, he first discovered the island of Dominica, and then several of the other West India Islands, among these Guadaloupe, where for the first time was tasted by Europeans that delicious fruit, the anana, or pineapple. Sailing on in the direction of Hayti, he discovered the island of Porto Rico; and on the 27th November, in the evening, arrived at that part of Hayti where he had built the fort, and taken leave of his companions.

The evening being dark, the land was hidden from their sight; and as Columbus knew that for the same reason the ships could not be seen by his friends on shore, he ordered guns to be fired to make known the joyful tidings of his arrival. But no guns were fired in return from the shore, no lights were to be seen; there was nothing to make known to them that their friends were alive, and glad to be once more united to them.

Columbus watched for the dawn of day with mixed feelings of hope and fear. When, at last, the approach of the morning sun began to light up the eastern horizon, rendering the objects on shore visible, in the place where the fort had stood, nothing was to be seen but a heap of ruins. No human being was near, neither Indian nor European. His alarm was now, indeed, great. He ordered the boats to be manned, that a party might land and ascertain how things really were, and he himself went at their head.

The natives at their approach did not welcome them, as they might have expected, like friends, but fled and concealed themselves as if afraid to be seen. Columbus, at length, with some difficulty, by signs of peace and friendship, persuaded a few of them to come forth to him. From them he learned that the companions whom he had left behind, instead of following his advice and orders, had not only attacked and ill-treated the natives, but had quarrelled among themselves. The consequences of this bad conduct were what might have been expected, and what Columbus wished to guard against when he guitted them. Some died by sickness from intemperance, some fell by the hands of their own countrymen, and others were cut off by the Indians, whom they had so shamefully treated, and who afterwards had pulled down and burnt the fort.

Sad as these tidings were to Columbus, who nad hoped to find his friends alive and happy, he could not but feel that his sailors had brought this destruction upon themselves.

His stay among these islands was much longer than it had been on his first voyage. He had not the same reason for anxiety to return to Europe. He once more explored the island of Cuba, and he discovered Jamaica, a large and beautiful island, a little to the south of Cuba.

In the autumn of 1495, Columbus prepared to return to Europe. The sea about these islands had always appeared so calm, that he imagined storms never happened. But just as the ships were ready for sea, a storm arose, such as no European had ever witnessed. The wind swept everything before it; trees, houses, cattle, men, and ships. Never had Columbus or any of his companions beheld anything so terrific. While the trees and the houses on the land were torn up and thrown down, the ships in the harbour were shattered to pieces, by being driven against each other, or dashed upon the shore. It was one of those greadful whirlyinds which now and then arise during the autumn in the West Indies. The Indians call this tempest a "Urican," and we now call such storms by nearly the same name. We term them "Hurricanes." When they are very violent, there is no safety except in the open fields.

When the storm was over, Columbus found that out of all his ships there was only one left so little damaged as to allow of his having her repaired. The others were total wrecks, but out of their fragments he contrived to build himself another ship. With these two vessels, the miserable remnant of a large fleet, he set sail from Hayti for Europe, on the 10th of March, 1496, and on the 11th of June following arrived in the Bay of Cadiz.

This voyage, which now usually occupies sailing ships about forty days only and which is performed much quicker by steam-vessels), took Columbus no less than ninety-three days. But captains of ships have now the advantage of knowing that the trade wind blows invariably from the Madeiras and Canaries to the West Indies; and they do not, therefore, attempt to sail straight across from the West Indies to the Canaries, directly against the wind, but they stretch more to the north towards the Azores; and in this direction they generally meet with favourable But Columbus had not yet learned that the trade wind blows invariably in one direction; and when he endeavoured to make the straight and short voyage across the Atlantic, he found himself constantly baffled by these same trade winds, which had favoured him so much in his voyages from Spain to the West Indies.

On the 30th of May, 1498, not quite two years

after his return from his second voyage, Columbus again set sail for the third time towards the West Indies. He was not yet satisfied with the discoveries that he had made, feeling convinced that there was a continent to be met with somewhere in the same direction. With the view of discovering this supposed continent, he determined this time to direct his course more towards the south. Accordingly, after touching at the Canaries, he did not, as before, stretch at once across the Atlantic, but continued in a southerly direction to the Cape de Verd Islands. Quitting these islands on the 5th of July, he steered south-westerly; and on the 31st of July, the mountains of the Island of Trinidad were discovered from the masthead.

It is curious to observe how badly Columbus appears to have been provided with sea stores for his voyages. It is a common thing now for vessels to be at sea for half a year or more without requiring a fresh supply of water. Salt meat and biscuit have been frequently brought back perfectly sound after having been three years at sea. Whereas Columbus, when he came in sight of the Island of Trinidad, had only sufficient water for three days, and his provisions were beginning to spoil, although he had been only two months out from Spain, and not more than twenty-six days from the Cape de Verds.

Having discovered the Island of Trinidad, which lies off the mouths of the River Oronoco, he sailed on, and became dangerously entangled in the strong currents formed by the rushing of that mighty river into the sea. He fortunately, however, got safe through the strait between the main land and the Island of Trinidad. In remembrance of the peril he had been in, he called this strait by the name of Dragon's Mouth. The River Oronoco is so large a body of water, that it makes the water of the sea fresh for many miles round its mouth. The swell of the waves which it occasions also is very dangerous to ships.

The discovery of this river was a source of much joy to Columbus. He felt assured that such a vast body of water must be supplied from a country of much greater size than any of the islands which he had discovered—that, in fact, it could only flow from the main land. He had now, therefore, arrived at that continent which he had so earnestly desired to find, and which he had twice before missed.

After coasting along the shore westward for a short distance, and landing in several places, he turned northward to Hayti, where he once more arrived in safety. He did not return to Europe till towards the end of the year 1500.

In a fourth voyage that he made during the year 1502, he discovered Guanega, an island off the coast of Honduras; and the people gave him news of a rich continent to the west. Had he sailed in this

direction he would have discovered Mexico. Instead of this he proceeded along the whole extent of coast from Truxillo, in Honduras, to the Gulf of Darien. He tried to land on the coast of Veragua, but was prevented by the natives. When he reached Jamaica, his ships were nearly wrecks; and in 1504 he returned to Spain.

In his third voyage he had discovered the Continent of America, and in his fourth he traced out a long line of its coast; and two years after his return from his fourth voyage this great and good man died; an event which took place at Valladolid in Spain.

Between Columbus' first and last voyage many other men sailed to the New World, and many new discoveries were made. In the year 1499, a merchant of Florence, in Italy, by name Amerigo Vespucci, set out with others on a voyage in this direction, and landed on the southern continent, near the River Oronoco. Although this Amerigo was only a follower in Columbus' track, yet, strange to say, the new countries have been called by his name. Since his discoveries along the Southern Continent, both the Western Continents have been called America; one South America, and the other North America; but the islands already spoken of are still called the West Indies, the name first given to them by Columbus.

Columbus made charts of the coasts, seas, and islands that he had discovered. Upon these charts he marked the various shoals and rocks that he had met with, and the straits and currents that he had passed through. He also marked the winds that prevailed in different places and in different seasons. By these charts he enabled other men to pursue the discoveries to which he had led the way, without incurring the same dangers, or sailing in the same uncertainty as himself.





THE DISCOVERY OF THE PACIFIC OCEAN.

COLUMBUS, as we have read, was the first man bold enough to venture across the Atlantic. His boldness was rewarded by the discovery of lands till then unknown to Europeans. When once the way had been pointed out, it was easy for other navigators to follow. Accordingly, many Spaniards undertook voyages of further discovery in the same track that Columbus had made known; and by degrees nearly the whole coast of America on the side of the Atlantic was explored.

Although Columbus had sailed along a small part of the continent of South America in his second and third voyages, he was not aware of its vast extent. One of the Spaniards, by name Alonzo de Ojeda, who had accompanied him in his second voyage, having obtained leave to pursue discoveries, sailed with Amerigo Vespucci, the man who, as before mentioned, gave America its name, for the New World; and he directed his course by the chart that Columbus had made. By the help of this he reached

the continent of America, sailed along the coast of the Gulf of Paria, passed through the Strait of the Dragon's Mouth, and so continued until he arrived at Maracapana, touching at Curiana and Cumana in his way.

After some delay, he sailed on until he arrived at a vast deep gulf, resembling a tranquil lake; on the eastern side of which was a village, consisting of about twenty houses, shaped like bells, and built on piles driven into the bottom of the sea, which is here very shallow. Ojeda gave to this gulf the name of Venezuela, which it bears at this present time. the bottom of the gulf is an inner gulf or lake, with a very narrow entrance, called the lake of Maracaibo. He continued his voyage along the western shores of the gulf, and standing out to sea, doubled Cape Maracaibo, and pursued his coasting voyage from port to port of this unknown continent, until he reached the long stretching headland, called Cape de la Vela. The bad state of his ships then forced him to return to Spain. He had sailed from port St. Mary in May, 1499, and he arrived back at Cadiz in June, 1500.

Another of the companions of Columbus, one of the brave men who had helped him in his first enterprise, by name Yanez Pinzon, also in 1499 undertook a voyage to the New World. He sailed from Palos in December of that year, and beheld land on the 28th January, 1500. This navigator suffered much from storms, and also, having crossed the Equator, lost sight of the Polar star. The sailors were exceedingly alarmed at this circumstance, as the Polar star was relied upon by them as one of their surest guides. Not knowing the shape of the earth, they thought that some prominence hid this star from their view. The land that Pinzon had discovered was Cape St. Augustine, in eight degrees south latitude, the most projecting part of the extensive country of Brazil.

As the fierceness of the Indians of this coast made it unsafe to land, he continued his voyage without delay to the north-west until he arrived within forty leagues of the Equinoctial line. Here he fell in with the mighty river Marascon or Amazon, the mouth of which is more than thirty leagues, or ninety miles, in breadth, and the water of which enters more than forty leagues into the ocean, without losing its freshness. He now re-crossed the Line, and coming again in sight of the Polar star, he pursued his course along the coast, passed the mouth of the Oronoko river, and entered the Gulf of Paria. He afterwards returned to Spain, and arrived at Palos in September, 1500.

Pinzon is the first European who crossed the Equator in the Western ocean. He is also the discoverer of Brazil.

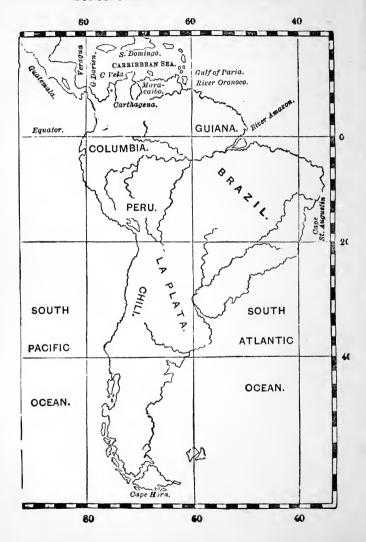
After this voyage of Pinzon, Ojeda made two other voyages, and the coast of South America was dis-

covered from Cape de la Vela to Veragua; so that the whole of the Atlantic or Eastern Coast of the Isthmus of Darien was thus known to the Spaniards, and they now began to make settlements there. But they knew nothing of the Pacific or Western Coast, nor did they know how narrow that neck of land was upon which they were. In general they obtained but little information about the interior of any part of the country, because they behaved everywhere with injustice and cruelty to the inhabitants, the unoffending Indians, from whom alone they could expect to learn anything.

At first, these poor people received them in full confidence, and were willing to let them share everything that they possessed. But the shameful conduct of the Spaniards, who repaid kindness with deceit and cruelty, soon made the Indians endeavour to prevent their landing, and to resist their coming among them. Upon this, the Spaniards acted as if the whole country belonged to them, and in every possible way tried to kill the Indians, and seize their lands, and burn their houses. It was owing to this disgraceful conduct that they did not sooner hear of the Pacific Ocean, and that all their attempts to plant colonies were attended with so much suffering to themselves, and so much destruction to the poor Indians.

Ojeda's third voyage was undertaken expressly to

LONGITUDE WEST FROM GREENWICH.



found a settlement, and he had with him Francisco Pizarro, who was afterwards known as the discoverer of Peru. Ojeda sailed on this voyage in 1509, from San Domingo, and late in the autumn arrived in the harbour of Carthagena. Already the character of the Spaniards was well known to the inhabitants of these parts; and it was soon seen that it would be impossible to make a settlement there without a struggle. Ojeda was advised by his more prudent friends to retire, but he resolved to land and reduce the natives to submission, by force. But they being numerous and warlike, he nearly lost his life in the attempt, and many of his companions were slain. He succeeded, however, in making good his retreat on board the ships. Shortly afterwards he landed on the eastern side of the Gulf of Uraba, or, as it is now called, Gulf of Darien, and built a fortress, called San Sebastian.

About this time, also, another Spaniard, of the name of Nicuesa, formed a settlement on the Isthmus of Darien, and built a fortress there, which he called Nombre de Dios, not very distant from the harbour of Portobello.

There was, besides, another expedition, commanded by Enciso, which set sail in search of Ojeda and his new Colony of San Sebastian. Among the ship's company was a man, by name Vasco Nunez de Balboa, who, although of a rich family, had, by his

bad habits, not only become very poor, but was also much in debt. He was in perpetual alarm lest he should be seized for the debts that he owed, and be thrown into prison. To avoid this, he contrived to get on board Enciso's ship, concealed in a cask, which was supposed to contain provisions. When the ship was far from San Domingo, Balboa came out from his hiding-place; and although Enciso at first was angry at the way he had escaped from the punishment which his bad conduct had deserved, yet he knew so well the services that Balboa would be able to perform, that he pardoned him.

By this time the settlement at San Sebastian had been broken up, the Spaniards having suffered much from the repeated attacks of the natives, who would no longer patiently submit to their unjust treatment. Soon after Enciso reached Carthagena, he was joined by Pizarro, with the wretched remains of the colony at San Sebastian. Enciso, however, in spite of what he heard, and what he saw, determined to continue his voyage to that settlement. Upon his arrival there, he found that Pizarro's account was but too true: for where San Sebastian had stood, nothing was to be seen but a heap of ruins. At this place misfortune followed misfortune; first he suffered shipwreck, and then he was attacked by the natives. In despair at these repeated disasters, Enciso was quite at a loss what to do, or where to go; when Balboa, the runaway Balboa, came to his support, and advised him to continue his course along the coast in Pizarro's little vessel.

Balboa stated that he had once before been on an expedition in this same gulf, and on the western side he well remembered an Indian village, on the bank of a river, called by the natives Darien.

Enciso, pleased with Balboa's advice, resolved to take possession of this village, and to drive out of it all the Indians. This scandalous resolution he put into practice. Arrived at the river, he landed his men, and without giving the unfortunate people of the village any notice, he attacked them, killed several, drove the rest out, and robbed them of all their possessions. He then made the village the chief place of his new government, and called it Santa Maria del Darien. Balboa assisted in this work of cruelty and injustice.

The Spaniards had not been long here, when they became tired with Enciso, for his conduct was not pleasing to them, and they refused to obey him, and sent him off in a ship to Spain. Upon his departure, Balboa took the command. And when he became Governor, he was one of the very few Spaniards in authority who treated the unhappy Indians with kindness, and whom they were inclined to trust.

In one of his expeditions into the interior parts of the Isthmus, in search of gold, he first heard of a sea to the west, as yet unknown to Europeans. He had received a large quantity of gold from an Indian cacique or chief, and was weighing it into shares for the purpose of dividing it among his men, when a quarrel arose as to the exactness of the weight. One of the sons of the Indian cacique was present, and he felt so disgusted at the sordid behaviour of the Spaniards, that he struck the scales with his fist, and scattered the glittering gold about the place; and before the Spaniards could recover from their astonishment at this sudden act, he said to them, "Why should you quarrel for such a trifle? If you really esteem gold to be so precious as to abandon your homes and come and seize the lands and dwellings of others for the sake of it, I can tell you of a land where you may find it in plenty. Beyond those lofty mountains," he continued, pointing to the south, "lies a mighty sea, which people sail upon, in vessels almost as large as yours. All the streams that flow down the southern side of those mountains. abound in gold, and all the utensils that the people have, are made of gold."

Balboa was struck by this account of the young Indian, and eagerly inquired the best way of penetrating to this sea, and to this land of gold. The young Indian warned him of the dangers he would meet with, from the fierce race of Indians scattered about the mountains who were cannibals, or eaters

of human flesh. But the curiosity of Balboa once roused was not to be quelled by accounts of difficulties and of dangers. He was, besides, desirous of getting possession of the gold, and of obtaining, by a discovery almost equal to that of Columbus, the pardon of the King of Spain for taking from Enciso the command of the settlement. He resolved, therefore, to penetrate to this sea, and immediately began the necessary preparations for the journey. It was in the year 1511 that he received this account, and he lost no time in sending to Hispaniola to request that the governor of that island, who was the brother of Columbus, would send him sufficient help to put his design into execution.

Balboa's application was not attended with the success which he expected. He had written to request that a company of 1,000 soldiers, with proper arms, should be sent to assist him in his perilous adventure. But instead of receiving these, the only news that reached him by the return of one of his messengers was, that he would most probably have the command of Darien taken from him, and be punished for assisting to dispossess Enciso.

This news made him determine no longer to delay his departure for the discovery of the sea beyond the mountains. Instead of the 1,000 men that he had thought necessary for the expedition, he found he could only muster 190. But, then, these 190 men were hardy and resolute, and much attached to him. He armed them with swords and targets, cross-bows, and arquebusses. He also took with him a number of blood-hounds. With so much cruelty had the Spaniards behaved towards the unhappy Indians, that even fierce dogs had been trained to hunt them out of their hiding-places, and to assist in destroying them. All this bloodshed and all this misery could the Spaniards cause for the sake of obtaining the gold and silver which were supposed to abound more in that part of the world than in any other.

Besides this little band, Balboa took with him a few of the Indians of Darien, whom he had won by kindness, and whose services would be of much use to him, from the knowledge of the wildernesses he was about to enter, and also from their knowledge of the habits of savage life.

On the 1st September, 1513, Balboa embarked at Darien with his followers, in a brigantine and nine large canoes. He sailed north-west, and arrived without accident at Coyba, the residence of the Indian cacique, from whose son he had first heard of the sea. From this cacique he obtained the assistance of guides and some warriors, and leaving half his men to guard the brigantine and canoes, he prepared to penetrate the wilderness before him with the other half.

It was on the 6th of September that he began his

march for the mountains which separated him from the great Pacific Ocean, of which he was in search. He set out with a resolution to endure patiently all the miseries and to combat boldly all the difficulties that he might meet with; and he contrived to rouse the same determination in his followers. The heat was excessive, and the Spaniards felt it the more, because they were encumbered with the weight of their armour, or iron plated dresses, and weapons. They had to climb rocky precipices, to struggle through close and tangled forests, and to cross marshes which continual rains had rendered almost impassable. Their Indian guides assisted them by carrying their provisions, and also by pointing out the least difficult paths.

On the 8th of September they approached an Indian village at the foot of the mountains; and the inhabitants fled in alarm into the fastnesses of the forest. The bad character that the Spaniards had obtained by their cruel and unjust conduct made every one fly from them. It was well for Balboa that he contrived, by kindness, to gain some friends among these alarmed people, or he could never have proceeded. In this village he halted several days to refresh his men, many of whom had fallen ill. But he was not idle during his stay here, for, having discovered the place to which the chief of the village had retreated, he prevailed upon him

to return, and so charmed him by the kindness of his manner, as to make him his friend. This cacique gave him all such further information as he needed to complete with success his daring enterprise, and told him that when he reached the summit of a lofty ridge of mountains, which he pointed out, the sea would appear spread out far below him.

The heat of the marshes, and the fatigue of forcing their way through the almost impassable forests, had, in the short space of two days, so injured the health of some of his men, as to make it impossible for them to proceed. These sick men Balboa desired to return slowly to Coyba, and having persuaded the cacique to assist him with fresh guides, and taking with him only such men as were robust and vigorous, on the 20th of September he again went forward.

Their journey was through a broken, rocky country, covered with forest trees and underwood so thick and close as to be quite matted together, and every here and there deep and foaming streams, some of which they were forced to cross on rafts. So wearisome was the journey, that in four days they had not advanced more than ten leagues, and they began to suffer much from hunger.

They had now arrived in the province of a warlike tribe of Indians, who, instead of flying and hiding themselves, came forward to the attack. They set upon the Spaniards with furious yells, thinking to overpower them at once. They were armed with bows and arrows, and clubs made of palm-wood, almost as hard as iron. But the first shock of the report from the fire-arms of the Spaniards struck them with terror. When they saw their companions fall bleeding and dead around them, they took to flight, and were closely pursued by the Spaniards with their blood-hounds. Well might these ignorant people think that they were attacked by some monsters, more cruel than any of the savage men or animals that they were acquainted with. cacique and six hundred of his people were left dead upon the field of battle. After the battle, the Spaniards entered the adjoining village, which was at the foot of the last mountain that remained to be climbed. This village they robbed of everything valuable. There was much gold and many jewels; and Balboa shared the booty among his band of followers.

But this victory was not gained without some loss on the side of the Spaniards. Balboa found that several of his men had been wounded by the arrows of the Indians; and these he was obliged to leave in the village, while he ascended the mountain. Sixty-seven men were all that remained of his party with health and strength sufficient to accompany him.

At the cool and fresh hour of daybreak he assembled his scanty band, and began to climb the height, wishing to reach the top before the heat of noon. The labour was severe, for the road was very rugged. About ten o'clock they came out from the thick forest through which they had been struggling ever since daybreak. The change from the closeness of the woods to the pleasant breeze from the mountains was delightful. But they were still further encouraged. "From that spot," exclaimed one of the Indian guides, pointing to the height above them, "may be seen the great sea of which you are in search."

When Balboa heard this, he commanded his men to halt, and forbade any one to stir from his place. He was resolved to be the first European who should look upon that sea, which he had been the first to think of discovering. Accordingly he ascended the mountain height alone; and when he reached the summit he beheld the sea glittering in the morning sun.

Balboa called to his little troop to ascend the height and look upon the glorious prospect; and they joined him without delay. "Behold, my friends," said he, "the reward of all our toil; a sight upon which the eye of Spaniard never rested before."

The Spaniards embraced their leader; and he, as

was the practice in those days, took possession of the sea, and the coast, and the surrounding country, in the name of the King of Spain. He then had a tree cut down, and made it into the form of a cross, and planted it on the spot from which he had first beheld the sea. He also made a mound, by heaping up large stones, upon which he carved the name of the King of Spain. The Indians saw all this done, and while they helped to pile the stones, and set up the cross, they little thought that they were assisting in depriving themselves of their houses and country.

This event took place on the 26th of September, 1513. The Spaniards had been twenty days in performing the journey from Coyba, in the province of Careta, where they had left the brigancine and the canoes, to the summit of the mountain; a distance which, it is said, may now be travelled in six days. The Isthmus hereabouts is eighteen leagues in breadth in its widest part, and in some places not more than seven leagues; but it is crossed by high and rugged mountains. Across this difficult country, in spite of every obstacle, did Balboa and his followers force their way, on their journey from the shores of the Atlantic. Without roads, or even paths, they followed the tracks of the Indians, which none but Indian guides could have made out.

Balboa was not content with merely beholding this

Ocean. He determined to descend to it, although the whole distance between him and the sea-coast was filled up with rocks, and thick forests, and green marshes. Being joined by such of his men as had recovered sufficiently, and whom he had left in the village after the battle, he set out on the 29th of September for the sea-coast.

He soon arrived at one of the vast bays of that coast. This he called St. Michael's Bay. The whole coast, as far as the eye could reach, was quite wild, and the sea had not a sail or canoe upon it.

When the Spaniards reached the shore, they found a beach half a league in extent, partly covered with sand and mud, with here and there a pool of water. "If this is a sea," said Balboa to his men, "like the great Atlantic, this beach will ere long be covered by its waters. Let us wait here,—a short time will decide whether there is a tide." So saying he seated himself under a tree. He was not long in doubt. The tide began to rise, and the waters rushed in so impetuously that they soon reached the place where Balboa and his party had placed themselves.

Balboa then arose, and marched into the sea until the water reached above his knees, and in the same manner as he had claimed a right to the land, he took possession of the sea for the King of Spain.

When this unmeaning and unjust ceremony was finished, he and all his followers stooped down and

tasted the water, which they found to be salt like the water of the other seas that they were acquainted with. They could no longer doubt that a new sea was discovered.

Both himself and his men also cut off branches from the trees, intending to carry them away as precious tokens of their discovery.

Balboa was some time employed in fighting with the Indian tribes that inhabited the sea-coast, and in hunting them with his blood-hounds. He soon made these helpless people submit. From them he once more heard of the rich country of Peru. One of the Indians also talked to the Spaniards about an animal that was employed in that country to carry burdens. He moulded a figure of clay to represent this animal, which some of the Spaniards supposed to be a deer, and others a camel; for as yet they knew nothing of the llama, the native beast of burden of South America.

Early in November, he quitted the borders of the Pacific Ocean, on his return across the mountains to Darien. His route homewards was different from that which he had before pursued, and the sufferings of his troop were much greater. Often they could find no water, the heat having dried up the pools and brooks. Many died from intolerable thirst, and those who survived, although loaded with gold, were exhausted from want of food; for the poor Indians

brought gold and jewels, instead of food, as peace offerings to the Spaniards.

At length, after much fighting with the various tribes of Indians that dwelt in the mountains, and much slaughter of them, and burning of their villages, Balboa and his troop reached Coyba, having robbed the Indians of all the gold and silver that they could find. There they embarked in the brigantine, and arrived the next day in the River of Darien.

Balboa brought with him the news of his success and discovery;—a discovery gained at the expense of much unnecessary cruelty and injustice towards the Indians. He brought back a small part only of his followers, and these half starved, and many of them dangerously ill. He was also ill himself with a fever, brought on by anxiety and toil.

By the Spaniards at Darien he was received with much delight and praise. And we may readily guess how cruelly the Spaniards must have behaved in general, when we find that Balboa was considered by the Indians, in spite of his conduct towards them, as not to have used them ill. The only praise that he really merited was that which was bestowed upon him by his followers: for he had endured with them every privation, and had been the foremost in every danger that they had met with.

Balboa despatched a ship to Spain, to carry the

news of his discovery. He sent also a part of the gold that he had carried off from the different tribes of Indians. A few days before this ship reached Spain, a new governor had been sent out, by name Pedrarias Davila, to take Balboa's place; and he had been sent with orders to punish Balboa for his conduct to Enciso.

Davila arrived in the Gulf of Uraba in June, 1514. He had departed from Spain with anything but friendly intentions towards Balboa; but when he arrived at Darien, and saw how much the Discoverer of the Pacific was beloved by all the people of the settlement, he hesitated through fear, and finally resolved to defer the execution of the orders which he had brought with him.

In 1516 Davila permitted Balboa to depart from Darien to Careta, for the purpose of building brigantines, and transporting them across the mountains, with a view to navigate and explore the Pacific Ocean.

Three years had elapsed since Balboa had discovered this ocean, and with joy he now prepared to build the ships, which were to be the first belonging to Europeans to sail upon it. Accordingly, as soon as he reached Acla, a town that had been built by the Spaniards in the province of Careta, he lost no time in preparing the materials for four brigantines.

The timber was felled on the Atlantic side of the Isthmus, and was then, with anchors, and cables, and rigging, carried across the mountains to the shores of the Pacific. Spaniards, Negroes, and Indians were all employed in this extraordinary work.

It must be remembered that there were no roads—nothing but the narrow Indian paths, which were only wide enough to allow one person to pass at a time; and they had to carry these materials through the thick forests, and across the torrents, along the precipices, and up the rugged parts of the mountains. All this hard labour had to be performed under the heat of a burning sun. Many of the unhappy Indians, unused to labour, sank on the road and died, overcome by the weight of their loads. The Spaniards and Negroes, being stronger, suffered less. At last, after descending the mountains, they reached the navigable part of a river which flows into the Pacific Ocean. This river they called the Balsas.

They had transported in this manner sufficient timber and rigging for two brigantines, when they discovered that all the timber was useless; for, having been cut near the sea-coast, a worm peculiar to those shores had bored such large holes in it, as to make it unfit for ship-building. The men were therefore obliged to cut down such timber as grew near the river; and Balboa, dividing his company may three bands, set one party to cut and saw the

wood, another to bring rigging and ironwork from Acla, twenty-two leagues distant, and the third party to search the country round, to gather together all the food that they could find.

The labour and difficulty of building these ships were very great. At one time the river, swollen with rain, suddenly overflowed its banks, and hardly gave the workmen time to escape; while part of the timber on which they were at work was carried away, and part buried in deep beds of slimy sand. The want of food was also felt; for the Indians had scarcely enough for themselves, not taking the trouble to cultivate the land.

Balboa, 'aving conquered all his difficulties, had the satisfaction of seeing the reward of his perseverance. Two brigantines were finished and floated on the river Balsas. As soon as they had been made ready for sea, he embarked with some of his followers, and sailing down the river, launched into the mighty waters. Thus he was not only the discoverer of the Pacific Ocean, but was the first to spread a sail upon it.

The discovery of this ocean led the way to a knowledge of fresh countries; and afterwards, Balboa's discoveries being continued by other men, to the knowledge of the shape of the Earth on which we live.

When not marching to conquer, he himself had

generally been kind and faithful to his promises to the Indians, but had not been able to make his followers the same. His name was loved by those unfortunate people, and he was esteemed by them as one of the few friends that they had among the strange people, who had come and by force taken possession of their country.

Nothing of any importance occurred during his stay in the Pacific. But his death was now about to put a stop to what further discoveries he might be contemplating. The new governor Davila, who was a bad and cruel man, and envious of Balboa on account of the discoveries that he had made, had long resolved to put him to death. The time having, as he thought, arrived, which was favourable for his villanous design, he sent for Balboa to return to Acla; and on his arrival he had him seized by one of his early friends and followers, Francisco Pizarro, (who afterwards discovered Peru,) and then, after throwing him into prison, he ordered him to be killed, by having his head cut off.

This unjust sentence was executed in the year 1517. Balboa, in the 48th year of his age, after a mock trial, was publicly beheaded at Acla. He died, as he had lived, a brave man. He ascended the scaffold with a firm step and a resolute countenance, and laying his head upon the block, it was severed in an instant from his body.



THE FIRST VOYAGE ROUND THE EARTH.

In the Indian seas, a few degrees on each side of the equator, and between 120 and 130 degrees east longitude, are situated the Molucca Islands.

About the year 1517, the possession of these islands was disputed by the kings of Spain and Portugal. Both kings claimed a right to them.

At that time, the Spaniards and Portuguese were the only two European nations that were much engaged in prosecuting discoveries by sea in the southern regions of the earth: the Spaniards towards the west, the Portuguese towards the east.

It had been agreed between these two nations that a line drawn from the north to the south pole, passing 370 leagues to the westward of the Azores, should be the boundary of their respective domains. All discoveries that might be made 180 degrees to the west of this line were to belong to the Spaniards, and all discoveries 180 degrees to the east of this same line were to belong to the Portuguese.

If we refer to the excellent and accurate maps and globes which we now have, it is easy to decide that, according to this strange agreement, the Molucca Islands belonged to the Portuguese, being more than 180 degrees to the west, and, therefore, less than 180 degrees to the east of a line of longitude drawn 370 leagues to the westward of the Azores.

But in those days geographers had not as yet learned how to measure degrees of longitude with accuracy; and it was really impossible to decide which of the two kings had the better imaginary title to the islands in question.

Although thus ignorant, these two kings, with their advisers, were not the less confident in asserting their claims. If either party felt any doubts, they were not honest enough to express them.

The Portuguese had been in the habit, for several years, of sailing to their possessions in the Indian seas, round the Cape of Good Hope; indeed, it had never been attempted to reach the Indian seas, by sailing in any other direction.

Fernando Magellan was the first person to make such an attempt. In consequence of the dispute concerning the Molucca Islands, he offered his services to Charles the Fifth of Spain, to conduct a fleet to those islands by the west, a voyage at that time not even known to be possible. Magellan was persuaded that a passage was to be found by sailing round the American continent; and he offered to take upon himself the hazard of attempting the discovery of it.

Magellan was by birth a Portuguese, and was a clever and educated man. He had been employed by the King of Portugal, but thinking that his services were not properly rewarded, he quitted Portugal, and went to Valladolid in Spain, where he was introduced to Charles the Fifth, who accepted his offers of service, and provided him with a fleet.

The ships entrusted to the command of Magellan were five in number, and were named the Trinidad, the San Antonio, the Vittoria, the Conception, and the Santiago.

With this fleet, Magellan sailed from San Lucar, on the 20th of September, 1519, and arrived without accident on the coast of Brazil. Hence he continued his voyage slowly to the south, and in April, 1520, reached a safe harbour, in nearly fifty degrees of south latitude. He called this harbour Port St. Julian; and here he resolved to pass the winter, which in this part of the world is extremely cold from May to September, the very time when, in our northern latitudes, we have the full enjoyment of summer.

The hardships which the crews of the different ships now began to endure made them discontented and unruly. It was necessary to be very careful with the provisions, which were distributed sparingly. This made the men murmur still more; and urged by some of their officers, they demanded to be conducted back to Spain. Magellan was not to be so easily turned aside from his undertaking, and refused to comply. He was aware that the bad conduct of the sailors was owing to the officers; and he resolved, therefore, to make an example of three of the commanders. Two of them he made prisoners openly, and put them to death. But the destruction of the other he accomplished by treachery.

The name of this last was Luis de Mendoza, the commander of the Vittoria. Magellan sent one of his men to the Vittoria, under some false pretence, with instructions, if he could find an opportunity, to put Mendoza to death. The man not being suspected was readily admitted to the ship, and while Mendoza was listening to the pretended message the man stabbed him.

By this means an end was put to the mutiny. But so strong a feeling of dissatisfaction still existed in the fleet, that Magellan found himself obliged to permit one of the vessels, the San Antonio, with its crew, to return to Spain. In the month of October, the commencement of the southern summer, with the four other ships he set sail from Port St. Julian. Unfortunately, however, in quitting that harbour, the Santiago was wrecked; and Magellan was then left with only three ships to continue his voyage.

In a few days he reached the Strait, which still bears the name of its discoverer, "The Strait of Magellan," situated at the southern extremity of the continent of South America.

Magellan felt confident, on entering this opening, that it was a channel or communication between two great oceans: 1st, because there was a strong current running towards the west, whereas if he had been at the mouth of a river, the current would have been towards him, that is, to the east: 2nd, because upon sounding for the depth, no bottom was to be found. He resolved therefore to proceed, and on the 28th day of November, 1520, the three ships cleared the Straits.

Great, indeed, was the joy of Magellan and the three crews at finding a passage by sea to the Pacific Ocean, that ocean which had first been discovered, near the Isthmus of Darien, by Balboa, one of the many Spanish adventurers who followed in the wake of Columbus, and a passage to which had long been an object of research.

Magellan was three months and twenty days in crossing this Ocean from the Straits, which bear his name, to the Philippine Isles, where he arrived the 16th March, 1521. During his passage, he fell in with only two islands, which, on account of their desolate appearance, he called the "Desventuradas," or "Unhappy." It so happened that he did not come

within sight of any of the numerous and well-peopled islands, which have since been discovered in those seas.

Magellan was the discoverer of the Philippine Islands. That cluster of islands received their name some years afterwards, when they were conquered by the Spaniards, in the reign of Philip II., their king. Magellan went on shore immediately upon his arrival, and was kindly received by the King of Zebu. It would appear that this king was at war with one of the neighbouring chiefs, and Magellan was foolish enough to make himself a party in the quarrel. He offered to assist the King of Zebu, with some of his crew and their fire-arms; and the King was of course glad to receive the aid of such powerful allies.

The Spaniards soon had cause to repent of their folly. They had no sooner entered the hostile territory, with Magellan at their head, than they found themselves surrounded by a large multitude, who attacked them with stones and other missiles. The Spaniards relied with too much confidence upon the effect which their fire-arms would produce upon the ignorant natives. They had been accustomed to expect victory from the mere report of their weapons. But the natives of these islands were not so timid a race as the unfortunate Indians, that the Spaniards had lately treated with so much cruelty. They stood their ground; and

the Spaniards, finding that their ammunition was all spent, began to retreat. As they gave way, the natives redoubled their attacks. Several of the Spaniards were killed, and others were grievously wounded. A large stone struck Magellan on the head, a second broke his thigh, and as he fell a shower of lances deprived him of life.

Thus perished Magellan, having completed the boldest navigation, excepting that of Columbus, which had been as yet accomplished, or has since been attempted. It was owing to his inexcusable folly that he did not survive to return to Europe, and receive the congratulations of his admiring friends and countrymen.

On the death of Magellan, the King of Zebu, for whom he had so wantonly hazarded his life, forgetting his pretended friendship for the Spaniards, treacherously put to death all of them who remained upon the island. Those who were on board the ships, when they learned the melancholy news of the slaughter of their companions and their chief, finding their numbers too small to manage three vessels, burnt the Conception, and with the other two went in search of the Moluccas.

In their voyage thither, they touched at several points on the eastern coast of Borneo, passed to the north of Celebes, and at length arrived at Tidor, one of the Moluccas, where they were kindly received by the king of the islands. The Trinidad being leaky, remained there some time to repair, and afterwards attempted to return by the Pacific Ocean; but meeting with contrary winds, was once more obliged to steer for the Moluccas, at one of which she arrived in a sinking state, and the crew were made prisoners by the Portuguese, who had possession of that island.

Meanwhile the Vittoria, under the command of Sebastian del Cano, proceeded on her voyage homeward, round the Cape of Good Hope, and arrived at San Lucar on the 6th September, 1522.

The crew were suffering much from the fatigues of a voyage which had lasted rather more than three years. But the distinction and honour with which they were received by their countrymen, for having succeeded in so bold an adventure, soon made them forget the labours and hardships which they had endured in this the first voyage round the world.

The Vittoria was drawn ashore, and long preserved in remembrance of this most remarkable voyage.

When Sebastian del Cano arrived at San Lucar, he was surprised to find that he had lost a day in his reckoning. According to the account which had been regularly kept on board the Vittoria during the whole voyage, he appeared to arrive in port on the 5th September; but, according to the reckoning kept

on land, the day of his arrival was the 6th September. And as he felt confident that there could not possibly be any mistake in his own reckoning, he was quite at a loss, and so also were his friends in Spain, to explain how two accounts, each kept with equal care, should differ in their result.

In those days the only method of marking time that was used on board of ships was by the sun; and although Sebastian del Cano was puzzled to account for his loss of a day, the puzzle with us would be how he could possibly go round the earth, from east to west, without appearing to lose a day.

The course of the ship being from east to west, while the daily rotation of the earth is from west to east, if we could but imagine the speed of the ship in one direction to be equal to that of the earth in the other,—that is, the whole circumference of the earth in twenty-four hours, how would the sun appear to the ship's crew? The answer is plain: the sun would not appear to change its position during the whole voyage. Supposing such a ship to start from a port at mid-day, the crew of that ship would perform the whole of the voyage at mid-day, and they would return into port at mid-day. But their friends on land, during the same period, would have seen the sun set and rise, and again come to the meridian; and the crew would consequently have lost a day in their reckoning.

Although the Vittoria did not sail round the earth in her course from east to west at so rapid a rate, her crew did not the less lose a day in their reckoning. Had that vessel sailed round the earth in an opposite direction, that is, from west to east, Sebastian del Cano would have found by his reckoning that, instead of losing a day, he would have gained a day, and marked one day more than his friends on land.

One of the greatest improvements that have been made since the time of Magellan to assist the navigator is the chronometer, or time-measurer. "Chronometer" is a word composed of two Greek words, which signify "time-measurer."

A chronometer is a watch made with so much care and skill as to go with almost perfect accuracy. The captain of a ship who takes a chronometer to sea, always knows, wherever he may be, the hour of the day at the place from which he started. And this again assists him to the knowledge of the part of the sea in which he is.

Suppose, for example, a navigator were to sail from San Lucar with one of these chronometers at noon, and after being some time at sea, were to observe that when it was noon by the sun it was one o'clock by the chronometer, that is, at San Lucar; he would then know that he was 15 degrees to the west of San Lucar, because in one hour the earth revolves as much as 15 degrees. And as there are

means well known to nautical men, by which the latitude can be ascertained, he would know exactly by his chart whereabouts on the wide sea he was situated.

In his progress westward, the chronometer would be one hour more in advance of the sun for every additional 15 degrees of longitude; and on his arrival back in the port from which he started, he would be 24 hours, or one day, as marked by the sun, behind the chronometer, because there are exactly twentyfour fifteens in 360 degrees, the whole circumference of the globe.

If while it was noon by the sun, the chronometer were to mark eleven o'clock in the day, he would then know that he was 15 degrees to the east of San Lucar. Continuing to sail eastward, the sun would gain upon the chronometer one hour for every 15 degrees of longitude; so that by the time he returned into the port from which he started, he would have marked one day more by the sun than by his chronometer.

The captains of vessels which are now continually sailing from England to Australia are well acquainted with this fact. They proceed round the Cape of Good Hope to Sydney, Melbourne, or Adelaide, and return round Cape Horn to London; thus pursuing an eastern course throughout their voyage, and finding on their arrival that they have marked one day more by the sun than by the chronometer.



SOMETHING MORE ABOUT AUSTRALIA AND NEW ZEALAND.*

Before leaving the subject of Captain Cook's great discoveries, it may be interesting to know what has been the result of his courage, zeal, and ability, besides the noble example he has set us of difficulties overcome.

The continent of which he was the chief discoverer is now the home of hundreds of thousands of industrious Englishmen and foreigners—men who, in their own crowded countries, found it difficult to provide for their families, or who were tempted to emigrate by a love of adventure. In the great towns on the coast every comfort of life can be enjoyed.

The first part of Australia that was colonized was New South Wales, about the year 1788. The chief town is Sydney, situated near Port Jackson, one of the finest harbours in the world. Tasmania, or Van Diemen's Land,—a romantic country, more like Ireland or Scotland than the main land of Australia—

^{*} The matter contained in this paper has been taken, by the kind permission of Messrs. Chambers, from their excellent works "The Miscellany," and "Repository of Useful and Instructive Tracts;" and from their publication entitled "Information for the People"

was colonized in 1803, fifteen years after New South Wales. Its chief towns are Hobart Town and Launceston.

Settlements were formed in the portion now called Western Australia in 1828, and the town of Perth founded; but this colony has been the least successful of the whole.

It was about the year 1835 that some shepherds from the Tasmanian side of Bass's Straits crossed over to seek pasture for their cattle, and found the district an excellent site for a colony. Thus was commenced the now flourishing province of Victoria. Its largest town, Melbourne, founded in 1837, is situated on a beautiful river a few miles from the harbour of Port Philip; but there are other towns of considerable size.

The rocky mountains in the neighbourhood of Melbourne, as well as of Sydney, were found in 1851 to abound in gold, which has proved a powerful attraction to crowds of emigrants; but gold from the rock, or money as wages, can only be obtained by steady labour, and few but the very strong and healthy can bear the amount of toil and privation which gold digging requires. After a time, hundreds of men return from the diggings, and, spreading over the colony, become farmers, agricultural labourers, or artizans.

The colony of South Australia, of which Adelaide is the capital, was founded in 1836, and has been very successful in bringing together the arts and comforts of civilized life, and in making people happy and respectable.

The colony abounds in pasture land: it is only twenty-three years ago that a small flock of fifteen sheep was landed in Adelaide, with the first settlers; now the sheep are counted by millions, and the beautiful wool obtained from this and the other colonies of Australia, furnishes England with the chief material for her woollen goods.

Valuable copper-mines were discovered in South Australia in 1846.

To all previous colonies the British Government had the right of sending unreformed criminals; but the founders of South Australia, wisely believing that such a practice tended greatly to injure the colony, when settling their charter with the English Government and Parliament, succeeded in obtaining a provision expressly forbidding any such criminals being transported to South Australia.

About 1859 or 1860, the great tract of country extending north from old Botany Bay *—the name of which was changed in 1834 to Moreton Bay—

^{*} A monument to the memory of Captain Cook was erected at Botany Bay in 1822.

became a separate province under the name of Queensland. Its chief city is Brisbane, on Moreton Bay. It is a most prosperous settlement, and of much greater extent than either New South Wales or Victoria.

There are not many rivers in Australia; and, so far as is known, only two of them, the Murray and the Darling, have a constant stream of water. In summer all the other rivers and lakes are either dried up or become mere swamps. The Murray, which has lately been explored, and which flows into the sea near Adelaide, from the Snowy Mountains in Victoria, has been navigated for fifteen hundred miles.

All the rivers that become useless in the summer have the peculiarity of suddenly disappearing under the sand, and then as suddenly becoming a lake of some hundred feet and even a mile in length; and when the traveller thinks he has found the course of the river, and sees the lofty banks and overhanging trees, he suddenly comes to a dry hard channel, without a drop of water, and plods his weary course for miles along its dry bed.

There are vast grassy plains, which in Australian language do not mean flats, but large undulating surfaces of ground, with park-like groups of trees scattered here and there. The grass is nourishing to the cattle, out very dry and arid-looking.

Very little of the interior of Australia is yet known, though numerous expeditions have been made recently Burke and Wells crossed Australia in 1861. Much of the central part is supposed to consist of sandy and stony deserts, resembling the deserts of Africa. It is from these deserts the hot winds blow which cause such inconvenience for a short time in the year in all the Australian colonies. These winds are like the blast of a furnace, or what may be felt by suddenly opening the door of a very hot oven. As this wind is often violent, it raises up clouds of dust, that sometimes darken the air to such an extent that a traveller will not be able to see the horse he is driving. These hot winds, or Simooms, are most felt in South Australia, where they last sometimes for more than a week.

The chief range of mountains extends on the eastern side of the Australian continent from north to south; but there are high mountains also in various parts of New South Wales, Victoria, South Australia, and Western Australia; some of these mountains being 5,000 feet high, and covered with snow. Towards the eastern shore, between the mountains and the sea, there are abundance of beautiful trees with thick foliage, and palms and tree-ferns. In Queensland, the woods are full of huge creeping plants, hanging from tree to tree in graceful festoons. But in other

parts of Australia different varieties of the gum-tree chiefly abound. These are giant-sized trees, having an extremely hard wood with very little foliage, and a strong aromatic smell. They are not pleasing in appearance.

But if the trees are not as beautiful in colour or form as those of our own country, they are often rendered gay by brilliant feathered birds fluttering from branch to branch. Flocks of bright green parrots alight upon the trees, and, in the sunshine, they are most gorgeous. The English settlers have named some of the quieter-plumaged birds after the English birds they most resemble—the linnets, and fly-catchers, robins, wrens, and goldfinches. Australian wren is a still smaller bird than ours, and does not conceal its nest so carefully. The nest, which is neatly made is, suspended from the branch of a tree by two loops that are placed on one side of the nest. The robin has a red breast like ours, but of a far more brilliant colour, equalling the scarlet of the brightest poppy. Cockatoos are very abundant, and in confinement become tame and affectionate. There are also flocks of wild pigeons, martins, and magpies.

Like the trees, and birds, and animals, and almost everything in Australia, the wild flowers are mostly different from those of Europe, and some are very beautiful. The prickly pear abounds. The climate being much milder in winter than in our own country, while the heat is greater in summer, grapes, melons, and figs grow with very little culture, and most of our own fruits and vegetables attain an unusual size. A mere fragment of a turnip in Australia is sufficient



for a meal. The chief native animals are the kangaroos and opossums, and a kind of dog called a dingo. There is also an animal of a very peculiar nature, resembling both a duck and a quadruped, having four webbed feet and a bill like a duck, with a skin covered with fur; it is called the ornithorinehus, and inhabits fresh-water lakes in New South Wales, where it is supposed to feed on worms, water insects, &c. No tribe of natives has been found superior to those described by Captain Cook. They are quiet and inoffensive, and will assist in keeping sheep for a season, but they dislike restraint and living in one spot for any length of time. Those natives in the north of Australia, of whom there are models in the Crystal Palace at Sydenham, are far the most savage-looking. In Tasmania no natives are now left.

NEW ZEALAND.

This land, seen by Tasman in 1642, and afterwards proved to be an island by Captain Cook, is now colonized in several parts. The first settlers landed so lately as 1839; but so fine is the climate, so fruitful the soil, and so beautiful the scenery, that New Zealand bids fair to become one of the most successful of all our colonics.

The soil is more suitable for corn than pasture; so that it will not have the vast flocks of sheep that Australia possesses, but will draw its wealth from other sources. There is a noble tree, the kauri, or cowdie, that grows to eighty or ninety feet before branching, and with a trunk of vast dimensions. This tree is now imported into England for making masts of men-of-war.

The fibres of the New Zealand flax are used for cordage, rigging, and fishing-lines, and mats of all kinds, and is very durable. The leaves are like our garden flag, and grow from six to ten feet long.

The Maoris, as the natives are called, are so much more intelligent than those of any other parts of the South Seas, that they can be readily trained to useful employments. They are very curious to know the use of everything, and quick in learning new customs. They have been taught to build houses, steer ships, plough, and even to perform some of the most delicate operations of gardening. They are brave and fond of independence, but perfidious and cruel. Having learned something of the art of war from the English settlers, the Maoris have been found by no means contemptible enemies. They have recently been guilty of a cruel massacre of the English colonists, and the peace of New Zealand is so often disturbed by their revolts, that it is feared self-defence may oblige the colonists finally to use more severe methods of repression than they have ever yet exercised.

No native quadrupeds have been discovered in New Zealand. The animals found there by the colonists were the descendants of those Captain Cook and other navigators had left there. Pigs abound in the country, and are much valued by the natives; and so are cats, which are also eaten by them; dogs, too,

are very numerous. The only reptile that has been discovered is a small lizard.

Captain Cook described the island as full of singing-birds, that sang through the night. There is a bird called the Tui, that has the power of imitating all other birds, and even the sound of quadrupeds.

As in Australia, the colonics are principally situated on the coast, and much has yet to be done to explore the interior.

There are many mountains of volcanic origin, and some are of great height, nearly as high as Mont Blanc in Europe; Mount Cook, in the Southern Alps—the name given to a group in the Middle Island—being 13,000 feet high; which is within 2,000 feet of the height of Mont Blanc.











